

# **National Incident Radio Support Cache User's Guide 2003**

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## National Incident Radio Support Cache (NIRSC) Users Guide:

The 2002 all-risk season presented us with some unique challenges:

It was the largest season for resources orders from an emergency communications support function, since the creation of the National Interagency Fire Center in the early 1960's. The season started early with the 2002 Olympics and Glamis Incident and then came fire season. And what a fire season we had. It was another record-breaking year.

- \* 202 Starter Systems were deployed from the National Cache
- \* 47,904 portable radios issued and maintained from the National Cache
- \* 1400 hours of infrared detection and mapping flights
- \* 4 states set new records for fire size.
- \* planning level "5" for 53 days
- \* 2 airtankers in catastrophic crashes
- \* nationally/interagency we logged an estimated 40 million hours on fire assignments

Incident Accountability Teams were organized and dispatched in fire season 2002 to evaluate corporate and personal accountability for fireline activities. From a communications point-of-view, lost and damaged radios reached a critical level. This trend needs to be reversed. Communications Unit Leaders and other incident communications personnel are ultimately responsible for issuing, tracking and recovering communications equipment.

It is important that all personnel involved in incident communications keep themselves up-to-date on the changes in equipment and technology. Several courses are scheduled for this year. I recommend that any Communications Unit Leaders that have not been out for a few years, or Communications Unit Leaders and Communications Technicians who would like some first hand experience with the new equipment, give Mark Hilton, Chief, Branch of Technical Training a call at 208-387-5707 and reserve a slot in one of our seminars.

I thank all of you for the work that you do in incident communications. Your role is vital and brings together all the functions under the Incident Command System. Thanks for your dedication and hard work.

If you have any questions for the National Incident Interagency Communications Division, please feel free to call me at 208-387-5485 or the Communications Duty Officer at 208-387-5644.

E-mail: [sjenkins01@fs.fed.us](mailto:sjenkins01@fs.fed.us).

Sincerely,

*/s/ Stephen M. Jenkins*

Stephen M. Jenkins  
Chief  
National Interagency Incident Communications Division

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This publication is revised annually by the National Interagency Incident Communications Division, National Interagency Fire Center at Boise, Idaho.

Additional copies of this publication may be ordered from:

National Interagency Fire Center  
ATTN: Great Basin Cache Supply Office  
3833 S. Development Ave.  
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Order NFES #0968



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# Hotsheet

For up-to-date information on Digital Radios, Training, Infrared Operations, new equipment in the NIRSC and more, visit the National Interagency Incident Communications Divisions web site.

[www.fs.fed.us/fire/niicd/Hotsheet/Hotsheet.html](http://www.fs.fed.us/fire/niicd/Hotsheet/Hotsheet.html)





## **INTRODUCTION**

This booklet is designed to aid in the evaluation of incident communications needs for users of the National Incident Radio Support Cache (NIRSC).

To use this guide:

1. Read the descriptions of incident communications conditions. Find those most closely reflecting your needs.
2. Each description corresponds to one or more drawings showing general and special purpose equipment applications. Match the condition to the drawing and verify the equipment specified will meet your needs.
3. When ordering equipment from the NIRSC, use the NFES catalog numbers indicated on the drawings or in the Descriptions section of this booklet. The NFES numbers must appear on your Resource Order.
4. The National Interagency Incident Communications Division Communications Duty Officer (NIICD CDO) is available 24 hours per day year around. NIICD CDO personnel provide ordering and planning assistance and are an information resource for field communications personnel. At a minimum, communications personnel should check in with the NIICD CDO upon arrival at incident to provide assignment location and phone number. All provided information is logged and updated daily. NOTE: Those communications personnel not familiar with NIRSC equipment or who are not experienced are required to contact the NIICD CDO for assistance. See NIICD ASSISTANCE NUMBERS (p. 3) for phone listings.

## **NEW FOR 2003**

### **2003 Changes:**

**NFES #4330 (Remote Kit):** The 4330 remote kit is going to be reworked this winter. The remote kit will stay DC controlled for now. A new remote dc adapter will be added to the kit.

One of the remotes will be taken off the system to make room for a new kit called the satellite remote kit. This kit will have a satellite phone installed in a satellite phone adapter. Call the NIRSC CDO for ordering assistance.

## **NIRSC ASSISTANCE NUMBERS**

The numbers listed below are for your general use for assistance from the staff at the National Interagency Incident Communications Division (NIICD) and the National Incident Radio Support Cache (NIRSC) at NIFC.

**CDO:** Phone:(208) 387-5644 For incident related business only. All other calls to the NIICD should be directed to individual division numbers.

Pager: (877) 991-1504 Paging phone number, follow instructions of the recorded voice. (Call 24-hour number below if no response.) Please be courteous give the NIICD CDO time to respond.

Celluar Phone: (208) 850-0994 If no response call 24-hour number.

Fax: (208) 387-5560

**24-Hour #:** (208) 387-5400 NIFC - National Interagency Coordination Center (NICC) Duty Officer will contact National Interagency Incident Communications Division Communications Duty Officer (NIICD CDO) to assist you.

For specific assistance from the National Interagency Incident Communications Division, use the following numbers: area code (208)

### **DIVISION NUMBERS:**

Branch of Communications Maintainece:	387-5856
Branch of Communications Operations:	387-5718, 5947, or 5787
Branch of Engineering and Development:	387-5720
Branch of Infrared:	387-5647
Branch of Rework and Supply:	387-5645
Branch of Avionics:	387-5643
Branch of Technical Training:	387-5707
Staff Assistant/Receptionist:	387-5487

## **NATIONAL AIR FREQUENCY GUIDELINES**

These Guidelines are intended to clarify the use of the national VHF-FM air frequencies and the VHF-AM (Victor) frequencies. Each is authorized for specific uses, even though they are listed as “national”.

### **AIR GUARD FREQUENCY**

There is one common air guard frequency - 168.625. It is found on the last channel of all NIRSC radios. This frequency is authorized for:

1. Air-to-air initial contact.
2. Emergency ground-to-air communications.
3. Initial call, recall and redirection.

### **NATIONAL FLIGHT FOLLOWING**

There is one common national flight following frequency - 168.650.

This frequency is authorized for:

1. Flight-following, dispatch, and/or re-direction of aircraft.
2. Air to ground and ground to air administrative traffic.
3. Not authorized for ground to ground traffic.

### **VHF-FM**

In the synthesized NIRSC radios, national VHF-FM air frequencies are located in GROUP 2 . These frequencies have specific uses. Prior to use, you MUST notify your dispatch center, who in turn should notify the Geographic Area Coordination Center (GACC) for clearance. To avoid problems, the GACC must know where each frequency is being used. Contact the NIICD CDO for more information.

FM Air Tactics	Group 2 - CH. 1	166.675	Air -to-Air, Air-to-Ground
FM Air Tactics	Group 2 - CH. 2	169.150	Air -to-Air, Air-to-Ground
FM Air Tactics	Group 2 - CH. 3	169.200	Air -to-Air, Air-to-Ground
FM Air Tactics	Group 2 - CH. 4	170.000	Air -to-Air, Air-to-Ground
FM Air Tactics	Group 2 - CH. 5	167.950	Air-to-Air, Air-to-Ground

## VHF-AM (Victor)

There are SIX national AM frequencies. The use of these frequencies is restricted to air operations only, no exceptions. The frequencies are assigned to specific functions as follows:

Frequency	Air-to-Air	Air-to-Ground	Fixed Wing	Rotor Wing
122.925	YES	YES	YES	YES
122.975	YES	NO	NO	YES
122.850	YES	YES	NO	YES
123.025	YES	YES	NO	YES
123.050	NO	YES	NO	YES
123.075	YES	YES	NO	YES

For additional VHF-AM frequencies the COML should make requests through the next higher authority. In multi-incident situations, this contact would be the Communications Coordinator (COMC). If no COMC has been assigned, contact the NIICD CDO. The NIICD CDO is authorized to obtain additional VHF-AM frequencies for the GACCs which will assign those frequencies.

## **FOREST HEALTH PROTECTION PROJECTS**

The NIRSC supports the Forest Health Protection Program with basic communications equipment. The NIRSC can be contacted with requirements or needs to customize an order to ensure it will be properly placed with the NIFC National Interagency Coordination Center (NICC).

All requests for equipment must be submitted through the local dispatch office and the Geographic Coordination Center, then to NIFC-NICC. Preliminary letters will be accepted by the NIRSC for informational purposes only, as will e-mail messages to [sjenkins01@fs.fed.us](mailto:sjenkins01@fs.fed.us). ***Equipment will not be issued against the letter or e-mail.*** A Resource Order, placed through the formal ordering process, is necessary.

The NIICD CDO will assist FHP users with system design information, layout and ordering, in order to meet the specific requirements of each particular project. Users are requested to contact the NIRSC at least 1-2 months in advance of a project(s) to allow for sufficient design, implementation and ground shipping of equipment.

The following equipment is available from the NIRSC:

- 4381 VHF radios (16/kit)
- 4312 Command Repeater
- 4300 Ground Aircraft Base Kit (base station only)
- 4330 Remote Kit

The above NFES items are the standard kits to support FHP projects. Other types of equipment are available if the project has unusual requirements. These other kits are described under the section EQUIPMENT DESCRIPTIONS in this catalog.

Radios are issued in kits of 16 each, but can be supplemented with individual radios if needed. It is preferred that radios be ordered in kit lots of 16. The radios will come with full, reusable clamshells which use AA batteries, plus one change of AA batteries for each radio. Please return the reusable clamshells with the kit. If you require additional batteries, above what is provided in the kit, place a resource order for NFES# 0030, AA batteries, or purchase the batteries locally.

The radios will be pre-programmed with NIRSC command/tactical frequencies. However given sufficient time, the NIRSC will custom program frequencies in each channel.

The repeater frequencies must remain as they are assigned.

The FHP equipment in the NIRSC must be shared with many FHP users. It is requested that required time frames for project use be kept to a minimum. When the project is completed, please expedite shipment of the equipment back to the NIRSC. The requesting user will pay for shipping to and from the NIRSC. There is no charge for equipment repair. Costs for use of the equipment include replacement of batteries and lost kit accessories or capitalized equipment.

## **GENERAL INFORMATION ABOUT RADIO BATTERIES**

When ordering batteries, round the order to the next full STD PK. (See Standard Pack -- STD PK--entry in the Radio Battery Matrix or see listing in the GENERAL SECTION of the NFES Catalog under Battery, Radio.)

Most batteries are received from the factory with paper seals on the contacts. Batteries still sealed can be returned to NIFC for credit. Alkaline batteries are not considered hazardous waste, except in California. These batteries should be disposed of at the incident.

All of the radio batteries utilized in the NIRSC are of alkaline technology. Alkaline batteries should have a shelf life of two years with only about 10% degradation in power. The batteries, for our application, can probably be stored in our application for four years, however the life will be noticeably shorter.

Repeater batteries should last 5-7 days under heavy usage. Radio batteries should easily last a shift (usually 12 hours).

The King disposable batteries on a two-watt radio should come close to a full shift; the clamshell-type battery will depend entirely upon the AA cells installed. Fresh, quality AA cells should perform nearly as well as a disposable battery.

As per Bendix-King, all NIRSC UHF and VHF King EPH and EPV handheld radios must use 9-cell clamshells. NFES# 1034 King clamshell, will be 9-cell.

Using a voltmeter to determine the state of an alkaline battery can yield very inconsistent results. A battery that no longer works on a repeater and has not had a load placed on it for a few days may read good on a voltmeter (a voltmeter does not apply the proper current load). To test the batteries in a repeater with a voltmeter put the repeater in transmit condition to apply a load to the batteries to get a correct reading.

DANIELS Repeaters -- replace batteries if the voltage is at 10.5 volts with the transmitter operating. Starting voltage is about 15 volts with the transmitter operating.

RADIOS -- The transmit LED is the best indicator of battery life. If the light holds bright for 3 seconds while transmitting, the battery should be in good shape.



## **RADIO/REPEATER BATTERY MATRIX**

CLAMSHELLS: NFES #5083 for ICOMS (12/box) Return KIT clamshells!  
NFES #1034 for KINGS (12/box) Return KIT clamshells!  
NFES #4165 for RACAL (each) Return KIT clamshells!  
NFES #4541for MOTOROLA XTS-3000/EFJOHNSON  
(each) Return KIT clamshells!

Frequently used batteries are listed below by type and NFES #.

NFES#	0030	1023	1233
VOLTAGES	1.5V	7.5V	6V (Hotshot)
STD. PK.	24/PG	4/BX	4/BX
RADIOS			
ICOM (clam)	10		
KING (clam) 9-cell (UHF/VHF)	9		
RACAL (clam)	10		
XTS-3000 (clam)	12		
KITS			
GRND A/C 4370, 4300	80 (4-PK)	4	
P.A. 4410			2
REMOTES 4330			4
REPEATERS & LINKS 4248, 4253, 4312, 4281		4	

**MOST BATTERY DISPOSAL SHOULD BE HANDLED AT  
THE INCIDENT. SAVE SHIPPING COSTS.**

## **COMMUNICATIONS COORDINATOR (COMC)**

### **Duties and Responsibilities**

2003

1. Manages the allocation of communications resources at the Geographic Area level. This includes communications equipment, communications personnel and associated supplies. The COMC reports to the NIFC-Communications Duty Officer (CDO) and directly supports the assigned Geographic Area. COMC's will not be assigned to specific incidents or to Area Command. Orders for this position should originate from the requesting Geographic Area. The order will go to NICC who will then forward the order to the NIFC-CDO to be filled.

Situations may occur when communications coordination is required between multiple Geographic Areas. Under these circumstances a COMC may be assigned to a NICC resource order to provide overall coordination and support to COMC's assigned to the affected Geographic Areas.

2. Manages the frequency resources for all incidents under assigned jurisdiction. This includes all frequencies for ground tactical, command, logistics, and air operations.

**NOTE:** During complex situations, the COMC will request additional qualified personnel to be assigned as field COMC's. Any situation involving large air operations will require that the Communications Coordinator (COMC) request an Aviation Frequency Coordinator just for Air Operations

3. Maintains an accurate inventory of all communications equipment assigned to complex(s) under their control. This includes equipment assigned to all incidents within the complex(s).

4. Keeps current on the availability of communications resources for future Geographic Area and National requirements. The COMC should be current on procedures needed to obtain such resources. Maintains daily contact with NIFC-CDO.

**NOTE:** This may entail pooling Communications Technicians (COMT) from existing incidents to better utilize this resource.

5. Provides problem solving recommendations and advice on communications issues to the respective Geographic Area Coordinators, the Area Coordinators, the Area Command Teams managing an incident complex, and/or to incident management teams within a complex or on incident. National as well as geographic area priorities will be considered when making recommendations and/or providing advice.
6. Provides the incidents with assistance in obtaining specialized communications equipment.

## **NATIONAL INCIDENT RADIO SUPPORT CACHE**

The information outlined below must be considered when ordering and using NIRSC equipment. All NIRSC frequencies, both UHF and VHF, must be cleared for use BEFORE shipment is made. Frequencies are cleared by the NIICD Communications Duty Officer (CDO).

### **STARTER SYSTEMS (NFES #4390):**

A starter system consists of 10 boxes of assorted equipment, and is ordered as a system. A starter system contains 1 VHF repeater and 1 UHF repeater. Generally the frequency assignments for these repeaters will be one of the standard VHF command assignments (C1 through C6) and one of the standard UHF assignments (L1 through L7).

When ordering a starter system appropriate frequency assignments must be obtained by contacting the NIRSC CDO or the appropriate Communications Coordinator (COMC) when assigned. The resource order will indicate which frequency pair has been assigned by the following example (C4/L4). When possible please provide a Latitude and a Longitude for each repeater set up in the field. Starter Systems ALWAYS contain 10 kits and 7 sets of masts (21 ea.).

**NOTE:** In areas with extreme frequency congestion, the NIRSC CDO or COMC will advise incidents/COMCs of available frequencies.

### **LOGISTICS SYSTEM:**

It is a part of every Starter System. It consists of 1 UHF Logistics Repeater and 1 kit of 16 UHF Logistics radios. If you do not need logistics equipment, you MUST order command equipment by individual kit catalog numbers.

### **ADDITIONAL REPEATER:**

When needed for an incident, the request will be evaluated and supported with another single frequency repeater. Order as a single resource item: Command Repeater - NFES #4312; Logistics Repeater - NFES #4248.

## **USER'S GUIDE (NFES #0968):**

It is located in all Command Repeater Kits (NFES #4312) and can also be ordered thru the Great Basin Warehouse (GBK).

## **COMMUNICATIONS DUTY OFFICER:**

The NIICD CDO as much as possible will maintain compatibility of new equipment orders with equipment already on an incident.

## **DEMOB:**

All cache equipment must be returned to the NIRSC after each incident for re-work.

## **FIELD ASSISTANCE:**

The NIICD CDO will coordinate field assistance for incidents. The NIICD CDO can be contacted at 208-387-5644.

## **(4305) MAST, ANTENNA**

The following kits come with at least one set of three masts.

- 4248 Log Repeater
- 4312 CMD Repeater
- 4330 Remote
- 4253 UHF link
- 4300 Ground VHF-AM Base Station
- 4370 Aircraft Link (2 sets)
- 4390 Starter System (7 sets)
- MAFFS Base Station (2 sets)

The NIRSC tries to keep a good supply of these masts on hand to support our kits. However, many do not get returned from incidents and we have to replace them. Shipping them individually is not recommended. It is highly recommended that they be returned with the kits they went out with. Do not return masts that are bent, squashed, badly out of round or otherwise not readily reusable.

## **EQUIPMENT DESCRIPTIONS**

### **4244 Logistics Radio Kit**

This radio kit is designed to be used for incident support personnel, e.g., Plans, Logistics, Finance. This kit contains 16 UHF radios. The radios operate independently or in conjunction with UHF Repeater Kit NFES# 4248.

Kits contain radios which have all NIRSC frequencies, including all simplex and repeat pair frequencies.

NIRSC frequencies must be cleared for use by the NIICD CDO. Frequency charts are in the kit.

The following frequency scheme indicates the channel on which the repeater frequencies will be found:

REPEATER	RADIO
L1	Group 2 Ch 2
L2	Group 2 Ch 4
L3	Group 2 Ch 6
L4	Group 2 Ch 1
L5	Group 2 Ch 2
L6	Group 2 Ch 3
L7	Group 2 Ch 4

### **KING RADIOS**

The NIRSC has kits of 210 channel EPV radios. These radios have 15 groups of 14 channels. Groups are accessed by turning the radio on, then, when GRP appears on the display, press the number on the front pad for the group desired. If radio shows a channel number, then press #, then press number on the front pad for group desired.

Refer to the kit frequency charts for additional information.

The EPV radios have a TA toggle switch on top. This is the talk-around switch. NIRSC recommends NOT USING this switch. When activated, the radio frequency moves 5 MHz up in frequency on all transmit channels, receive channels are not changed.

These radios are password protected. The NIICD CDO will give the authorization code to communications personnel upon request.

**NOTE: All NIRSC UHF King Radio Kits will use the 9-cell battery clamshells. Do not use more than 9 cells!**

#### **4248 Logistics Repeater Kit - ( DANIELS)**

The Logistics Repeater must be used in conjunction with a Logistics Radio Kit, NFES #4244 . It is a battery operated portable repeater kit designed for mountainous terrain and/or extended area coverage.

Uses include:

- ICP to Expanded Dispatch Center
- Helibase to ICP
- Ground Support Unit
- Outlying service functions to the Incident Communications Center (ICC)
- Non-fire related incidents can utilize these kits in command/tactical situations.
- Staging area to ICP
- Helispots to ICP

Resource Orders should indicate which frequency is needed, L1, L2, etc.

NIRSC frequencies must be cleared for use by the NIICD CDO.

Logistics repeaters have the following frequency designators:

<u>REPEATER</u>	<u>RADIO CHANNEL</u>
L1 Logistics Repeater	Group 2/Ch 2
L2 Logistics Repeater	Group 2/Ch 4
L3 Logistics Repeater	Group 2/Ch 6
L4 Logistics Repeater	Group 1/Ch 1
L5 Logistics Repeater	Group 1/Ch 2
L6 Logistics Repeater	Group 1/Ch 3
L7 Logistics Repeater	Group 1/Ch 4

#### **4253 UHF Link - (DANIELS)**

This kit can be used to link UHF-FM and VHF-FM together to extend area coverage for large incidents.

Uses include:

The kit is used to link two (2) VHF-FM repeaters (NFES# 4312), using NIRSC frequencies.

It can be used to link one (1) or more VHF-FM repeaters in configuration with a UHF repeater to establish communications with the incident operations area back to an ICP located in difficult terrain.

The DANIELS compatible kit has two (2) modules (1- RX and 1- TX) that plug into the (NFES # 4312) Daniels repeater backplane and two (2) RF cables that connect the modules to the antenna relay. A UHF whip antenna and a UHF Yagi antenna with 20 foot RF cables are included in the shipping container to expedite all installation options.

If possible please remove the UHF transmitter & receiver from the repeater and return UHF links in their skydyne box.



## **4281 Crossband Link Kit**

The crossband link is designed to provide support for special operations on an incident that requires UHF frequency to VHF frequency conversion. This unit is in a Daniels rack with both a UHF transmitter and receiver and a VHF transmitter and receiver and can be programmed with special frequencies. Please contact the NIICD CDO for ordering, designing and frequency coordination. This unit is not a repeater.

## **4300 Ground VHF-AM Base Station Kit**

This kit is a portable 760-channel VHF-AM base station. This kit cannot be linked or remoted. Kits are used primarily as a base station to contact aircraft on Forest Health Protection projects, and incidents. Base stations will transmit 7 watts, are capable of 10 pre-set channels, will scan, and operate using 115 VAC, or 12 VDC through an automobile accessory plug-in. Four (4) handheld ICOM VHF-AM radios are included, as well as T-cards for radio check-out.

If this kit is to be used as an FAA portable control tower, the NFES 4300 order MUST be placed by the incident COML for the FAA controller.

## **4312 Command Repeater - (DANIELS)**

The Command Repeater must be used in conjunction with a Command/Tactical Radio Kit, NFES #4381. The kit is a battery operated portable repeater designed for mountainous terrain and/or extended area coverage applicable to incident operational requirements. NIRSC Command Repeaters will link to UHF Link Kits (NFES #4253).

Repeaters should be ordered by NFES # and by frequency: C1, C2, C3, C4, C5, C6. NIRSC frequencies must be cleared for use BEFORE shipment is made. Call the NIICD CDO for clearance. The NIICD CDO (208) 387-5644 will assign a frequency if not indicated on the Resource Order.

All Command Repeaters are single channel. If an additional repeat frequency is necessary, a separate Command Repeater must be ordered. Orders will be filled based on priority need. Frequencies must be coordinated to reduce interference problems.

All repeaters are capable of being tone-controlled (decode only). A tone-controlled repeater will operate as a normal repeater (carrier squelch) when not in the tone mode. Call the NIICD CDO for more information on tone-control applications.

NIRSC Channel Plan: Radios are configured to match up with repeaters as follows:

(Radio)	(Radio)
KING	KING
Cmd Repeater C1 Group 1 Ch 5	Cmd Repeater C4 Group 3 Ch 5
Cmd Repeater C2 Group 1 Ch 7	Cmd Repeater C5 Group 3 Ch 7
Cmd Repeater C3 Group 1 Ch 9	Cmd Repeater C6 Group 3 Ch 9

**Note: If a special repeater is being sent to your incident the COML will need to program the radios with the frequencies.**

### 4330 Remote Kit

This kit can be used with VHF-FM (tactical) and UHF-FM (logistics) radios. Use of this kit, in conjunction with NIRSC radios, allows a remote base station to be installed up to a half mile away from the ICP, camp, helibase, etc. If more field wire is obtained, runs up to several miles can be made.

The radio, chassis and battery are enclosed in a steel box which is removable from the shipping container. This allows for placement of the box at the base of the antenna while running only a wire pair to the desk set location. One interface cable is available in the chassis box for connection to each make and model of radio within the NIRSC cache.

Several antenna options are available including omni directional UHF and VHF antennas and a breakdown UHF Yagi directional gain antenna.

## **4370 Ground Aircraft Radio/Link Kit**

This Daniels kit is a portable, battery operated, all in one, VHF-AM aircraft base station and UHF-FM link. All aircraft kits operate as a base station or as a cross-band link. There are two sets of antennas (VHF-AM and UHF-FM) for use in the link configuration. All kits include four (4) handheld ICOM VHF-AM radios.

The Ground Aircraft Radio/Link uses a 12 Volt DC power source. The unit can be operated from the supplied alkaline batteries (@ 15 Volts) or from an external 12 Volt DC power source (i.e. heavy duty car battery, DC power supply, or solar panels). If a 12 Volt DC power supply is used, it should have a minimum 5 amp continuous duty capability. Additional ICOM radios can be ordered to supplement a full kit. Call the NIICD CDO for ordering assistance. Supplies are limited, therefore orders will be filled on a priority basis.

## **4381 Command Radio Kit**

This kit is designed for use in command and tactical operations of an incident. Each kit contains sixteen (16) handheld radios. All radios are configured with all tactical, command and national air frequencies. The radios in each kit are the same.

The issue document that you receive with these kits will reference a subkit, i.e. (4353) issued with the kit. This subkit, is not a separate item and therefore not visible or trackable. It is used to capture costs of the accessories for the different radio's that you receive. It is for NIRSC use only. Frequency charts are included in the kit, as well as T-cards for radio checkout.

Boxes are labeled on the outside to indicate the type of radios contained inside according to the following convention:

4381-K\_\_\_ \_\_\_ \_\_\_ (K = King, R=Racal)

NIRSC frequencies must be cleared for use BEFORE shipment is made. Call the NIICD CDO for clearance.

The following lists the repeater frequency designation with the corresponding radio channel assignment.

(Radio)	(Radio)
KING	KING
Cmd Repeater C1 Group 1 Ch 5	Cmd Repeater C4 Group 3 Ch 5
Cmd Repeater C2 Group 1 Ch 7	Cmd Repeater C5 Group 3 Ch 7
Cmd Repeater C3 Group 1 Ch 9	Cmd Repeater C6 Group 3 Ch 9

### **KING RADIOS:**

The radios are programmed by the NIRSC to be compatible with each system in which they are included. EPH series radios are 210 channel and either narrow or wide-band.

In the 210 channel radios, only 4 groups have been programmed. These radios have 14 channels of 15 groups. Groups are accessed by turning the radio on, then when GRP appears on the display, press the number on the front pad for the group desired or if channel number is displayed then

press # then press the number on the front pad for the group desired. Look at the frequency charts in the kits for changes from the normal

NIRSC VHF frequency scheme. These radios are password protected and cannot be field programmed without an authorization code. The NIICD CDO will supply the authorization code only to communications personnel.

The NIRSC recommends that the SCAN mode and HIGH POWER options not be used, as these options rapidly reduce battery life. AA battery clamshells (NFES #1034) provide convenient battery replacement. Clamshells included in kits must be returned. Clamshells require 9 each of the AA batteries (NFES #0030) for operation.

**NOTE: All NIRSC King Radio Kits use the 9-cell battery clamshell. Do not use more than 9 cells!**

## **4390 Starter System - ICS Command/Logistics Radio System**

This system is designed to be the initial system to support basic incident communications requirements. The system supplies equipment which will facilitate immediate communications for command, tactical, logistical and ground-to-air needs. The Starter System consists of:

- 1 Command Repeater (should specify frequency)
- 3 CMD/TAC Radio Kits (total of 48 radios)
- 1 Ground Aircraft Radio/Link Kit (with 4 ICOM radios)
- 3 Remote Kits
- 1 Logistics Repeater (should specify frequency)
- 1 Logistics Radio Kit (total of 16 radios)

A logistics capability is sent with all Starter Systems, i.e, logistics repeater, logistics radio kit. Use of NIRSC frequencies must be cleared by the NIICD Communications Duty Officer (CDO) prior to shipment. The NIICD CDO will assign frequencies if not indicated on the Resource Order.

An NIRSC User's Guide (NFES# 0968) is included in each system in the Command Repeater Kit.

In the case of a multi-branch or multi-incident complex, if several ICS Starter Systems are ordered, or if communications personnel are not familiar with NIRSC equipment, the NIICD CDO must be contacted for ordering, system planning and frequency coordination assistance.

NIICD CDO contact numbers:

Phone: 208-387-5644

Celluar: 208-850-0994

24-hour #: 208-387-5400 (Ask for the NIICD CDO to be paged.)

## **4410 Public Address Kit**

This kit is primarily used at the ICP or in staging areas which house large numbers of personnel. It allows for the broadcasting of information or paging from a central point. Amplifier can be powered by either A/C or batteries.

## **4499 Air Attack Kit**

This kit is built to supplement communications in contracted fixed-wing aircraft for missions ranging from reconnaissance to complex air attack. This kit can fit between the pilot and co-pilot seats in some aircraft (i.e. Cessna) and slightly behind the front seats in other aircraft. This kit creates an interface between the aircraft's existing audio system/radios and the Air Attack kit radios. All kits have the capability to operate two Technisonic Industries radios. NIRSC will issue two VHF-FM radios per NFES 4499. One radio will be the TFM-138B. The second will be another TFM-138B or a new Project 25 digital TDFM-136.

The NFES 4499 Air Attack has a Dual Audio Control (COM/FM1/FM2/AUX1/AUX2/SC) for the pilot and co-pilot/ATGS, connectors for two AUX-FM type portable radio adapters, and two passenger headset adapters. Kit headset jacks are 600-ohm impedance using standard audio and mic type connectors. The pilot and co-pilot/ATGS utilize case mounted headset. Both passengers can operate all radios through the co-pilot/ATGS's transmitter selector. The "SC" position is simulcast transmission on both COM (aircraft VHF-AM) and FM1. Each kit includes two passenger headset adapters, two PT-300 PTT adapters, two BNC barrel connectors (for AUX-FM antenna connections), and instructions. Two (2) externally mounted VHF antennas are also required for operation.

For non-fire related incidents, the VHF-VHF radios could be changed to give the kit a VHF-UHF capability. An external UHF antenna would be necessary on the aircraft. These requests will be done only on a case-by-case basis. Coordination with the NIICD-CDO is required.

This kit will ONLY be installed in aircraft meeting the National Air Tactical/ Reconnaissance Standards and passing an avions inspection by a Forest Service/OAS avions inspector.

The NFES 4499 Air Attack AUX-FM portable radio adapter connectors accept the same adapter connectors used in all helicopters. Contact the NIICD CDO for availability of King & Racal AUX-FM adapter cables.

## **MAFFS Base Station**

There are 3 MAFFS Base Stations (TAF-550) ready for issue. There are 2 additional TAF-550 units not assembled in kits. MAFFS stands for Modular Airborne Fire Fighting System and is used in conjunction with Military C-130 Airtanker use. The three MAFFS Base Stations ready for issue will only be issued to tanker bases dedicated to Military C-130 MAFFS Airtankers.

This portable kit is a combination 138 to 174 Mhz VHF-FM and 760 channel VHF-AM base station. The kit cannot be linked or remoted. Kits are used primarily for MAFFS Tanker Bases and other sites needing both VHF-FM and VHF-AM communications. The VHF-FM radio is a Technisonic TFM-138B airborne radio capable of transmitting 10 watts , 120 preset channels, simultaneous Air Guard (168.625) reception, and scanning. The VHF-AM radio will transmit 7 watts, is capable of 10 preset channels, and will scan. The TAF-550 operates using 115 VAC or 24 VDC/12VDC through an automobile accessory plug-in (24 VDC and 12 VDC plug-ins are not included with either dedicated MAFFS Base Station). A headset for the TAF-550 is included for noisy environments in addition to a handheld mic.

MAFFS kits also include 8 King 210 channel VHF-FM handheld radios, 4 Hi/Low impedance headsets and adapters.

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## GENERAL COMMUNICATIONS CONDITIONS & SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES#	DWG#
All incident area is not line of sight	<b>CMD/Tac Radio Kit</b> <b>CMD Repeater</b> Use of a repeater generally allows more flexibility and gives wider coverage.	4381 4312 4330	1
Logistics points are not line-of-sight.	<b>Logistics Radio Kit</b> <b>Logistics Repeater Kit</b> <b>Remote Kit</b> To be used to tie logistics points together if not line-of-sight.	4244 4248 4330	2
ICP/ICC not in line -of-sight with incident CMD Repeater.	<b>CMD/TAC Radio Kit</b> <b>CMD Repeater</b> <b>Remote Kit</b> Remote Kit will allow ICP/ICC radio to be installed at a location up to one mile away, where line-of-sight exists, but be controlled from the ICP/ICC through a desk set.	4381 4312 4330	3
Need to backbone CMD Repeater to reach the ICP/ICC due to terrain problems.	<b>CMD Repeater</b> <b>UHF Link</b> <b>Logistics Repeater</b> <b>Remote Kit</b> Logistics UHF and CMD VHF are not normally linked. However, terrain problems may dictate linking a CMD Repeater, via a UHF Link to a Logistics Repeater, for the incident operations area to reach the ICP/ICC.	4312 4253 4248 4330	4
Need to link two ends of an incident which has considerable linear distance or terrain problems.	<b>Two CMD Repeaters</b> <b>Two UHF Links</b> <b>Remote Kit</b> UHF links are hard-linked to CMD repeaters, which are located to cover the far ends of the incident. Repeaters are linked via a designated UHF frequency.	4312 4253 4330	5
Need to link more than two CMD RPTs to cover large incident, multiple small incidents.	<b>Three or more CMD RPTs</b> <b>Three or more UHF Links</b> <b>Remote Kit</b> UHF Links are on same simplex frequency which allows linking of all CMD RPTs. All UHF Links MUST be line-of-sight with each other. Each CMD Repeater is on a different frequency. Call NIICD CDO for assistance.	4312 4253 4330	6

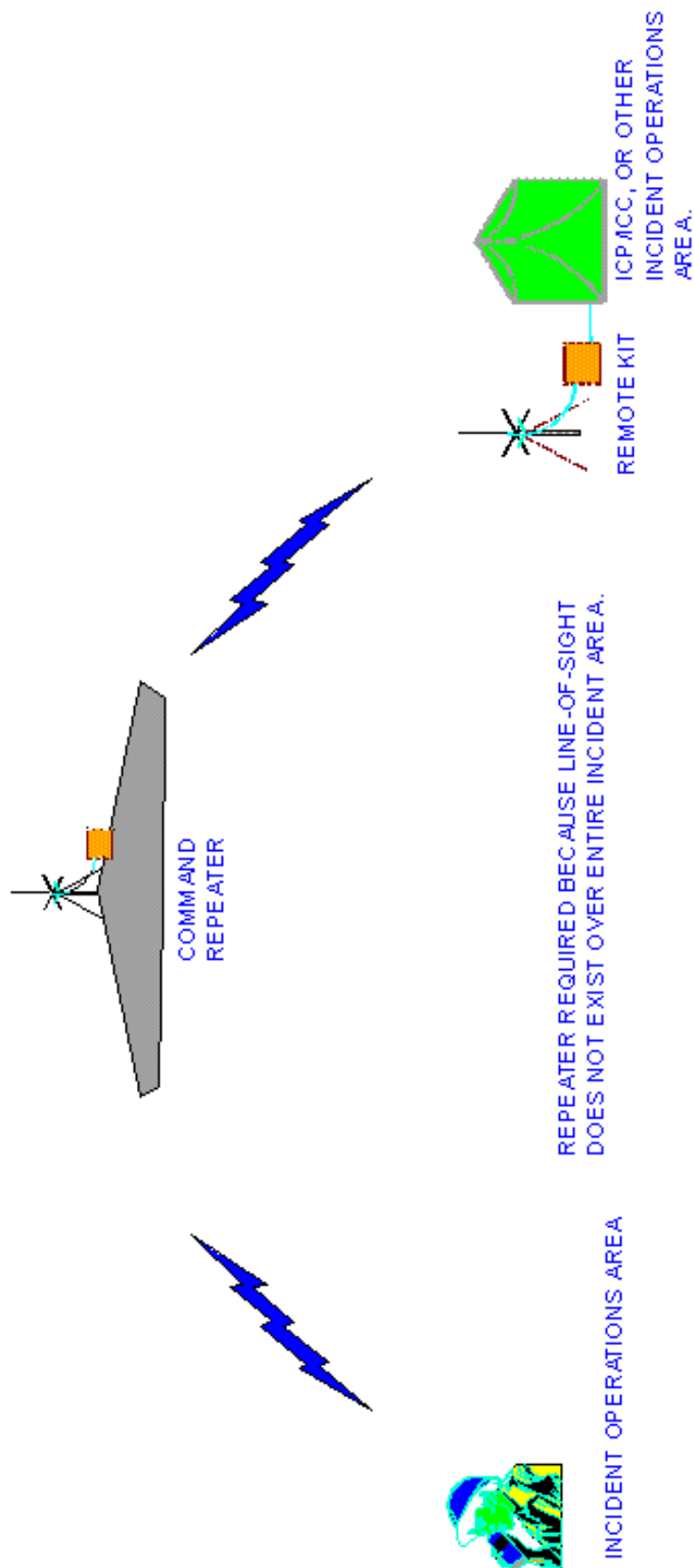
## GENERAL COMMUNICATIONS CONDITIONS & SOLUTIONS

CONDITIONS	EQUIPMENT SOLUTIONS	NFES#	DWG#
Need to link two ends of an incident over long distance OR neither CMD Repeater can reach the ICP/ICC.	<b>Two CMD Repeaters</b> <b>Two UHF Links</b> <b>Logistics Repeater</b> <b>Remote Kit</b> UHF Repeater links both linked CMD Repeaters to the ICP/ICC or UHF Repeater is needed to link both CMD Repeaters due to terrain and distance.	4312 4253 4248 4330	7
Need to link more than two CMD RPTs. All UHF Links are not line-of-sight with each other. Used to link large incident or multiple small incidents.	<b>Three or more CMD RPTs</b> <b>Three or more UHF Links</b> <b>Logistics Repeater</b> <b>Remote Kit</b> UHF Repeater is hub which links all CMD RPTs. All UHF links <b>MUST</b> be line of sight with the UHF RPT. ICC/ICP can be tied in through one of the CMD RPTs, or the UHF RPT. Each CMD RPT is on a different frequency. Call NIICD CDO for assistance.	4312 4253 4248 4330	8
New, growing incident needs communications.	<b>ICS Starter System:</b> Contains sufficient equipment to initially supply a new incident which has potential for increasing in size.  System includes:  CMD Repeater (identify freq.) CMD/ TAC Radio Kits (3 ea.) Ground A/C Radio/Link Kit Remote Kit (3 ea.) Logistics Repeater (identify freq.) Logistics Radio Kit (1 ea.)	4390	

# COMMAND/TACTICAL RADIO KIT AND COMMAND REPEATER

1 EA. 4381 CMD/TAC RADIO KIT  
1 EA. 4312 COMMAND REPEATER  
1 EA. 4330 REMOTE KIT

NOTE: SHOULD SPECIFY REPEATER  
FREQUENCIES WHEN ORDERING.

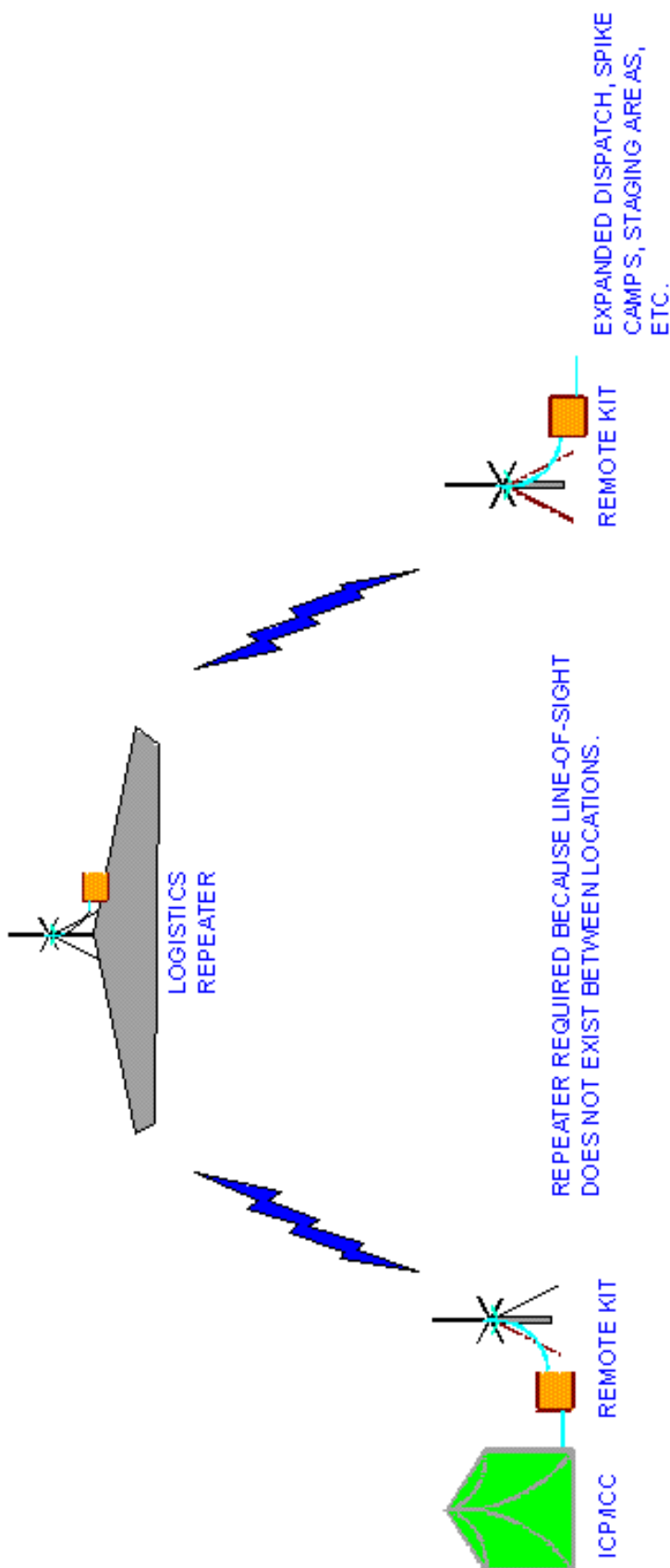


DRAWING 1

## ONE-HOP LOGISTICS REPEATER WITH LOGISTICS RADIO KIT

1 EA. 4244 LOGISTICS RADIO KIT  
1 EA. 4248 LOGISTICS REPEATER  
2 EA. 4330 REMOTE KIT

NOTE: SHOULD SPECIFY REPEATER  
FREQUENCIES WHEN ORDERING.

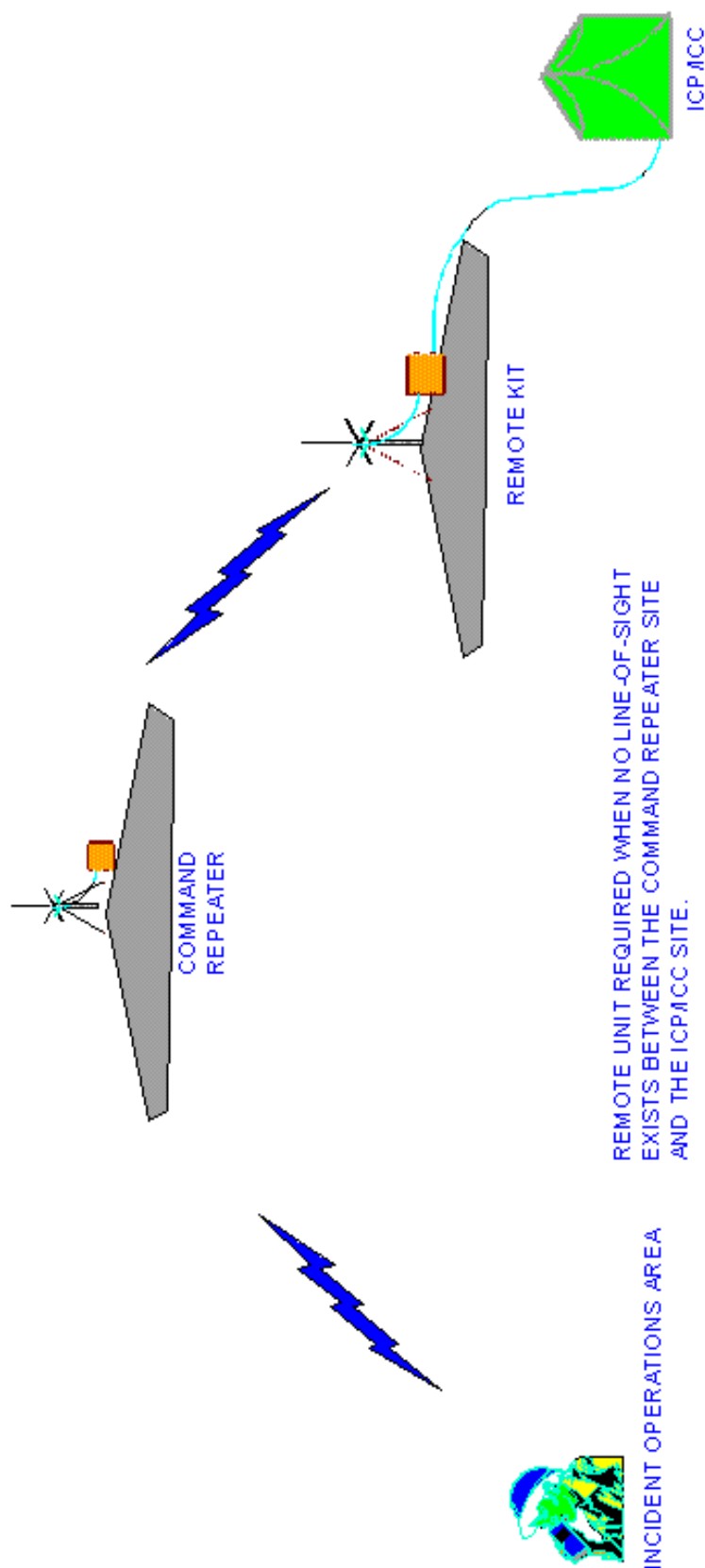


DRAWING 2

# COMMAND/TACTICAL RADIO KIT AND COMMAND REPEATER WITH REMOTE KIT

- 1 EA. 4381 CMD/TAC RADIO KIT
- 1 EA. 4312 COMMAND REPEATER
- 1 EA. 4330 REMOTE KIT

NOTE: SHOULD SPECIFY REPEATER  
FREQUENCIES WHEN ORDERING.

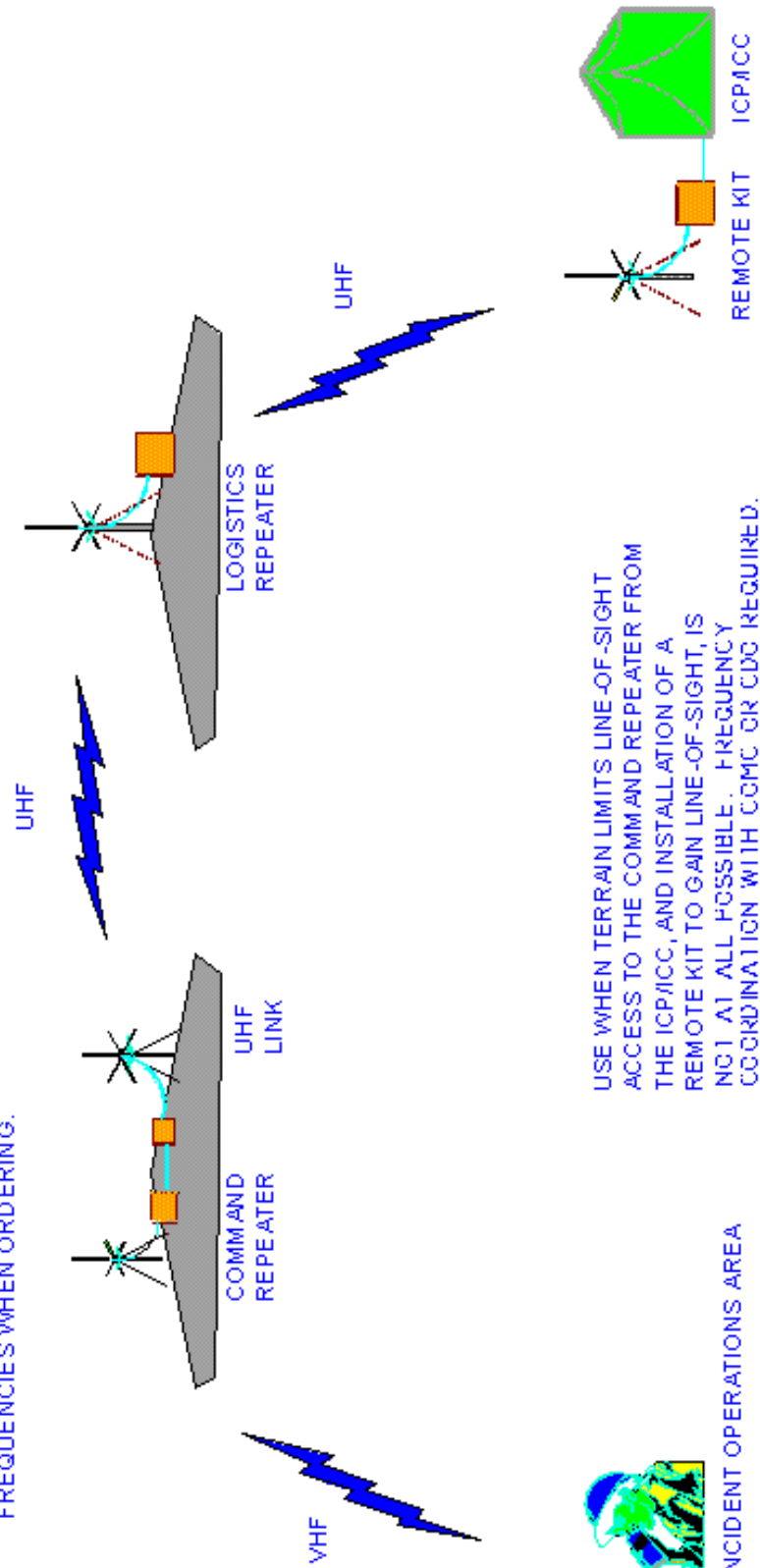


DRAWING 3

## INCIDENT OPERATIONS AREA TO ICP/ICC BACKBONE

1 EA. 4248 LOGISTICS REPEATER  
1 EA. 4253 UHF LINK KIT  
1 EA. 4312 COMMAND REPEATER  
1 EA. 4330 REMOTE KIT

NOTE: SHOULD SPECIFY REPEATER  
FREQUENCIES WHEN ORDERING.

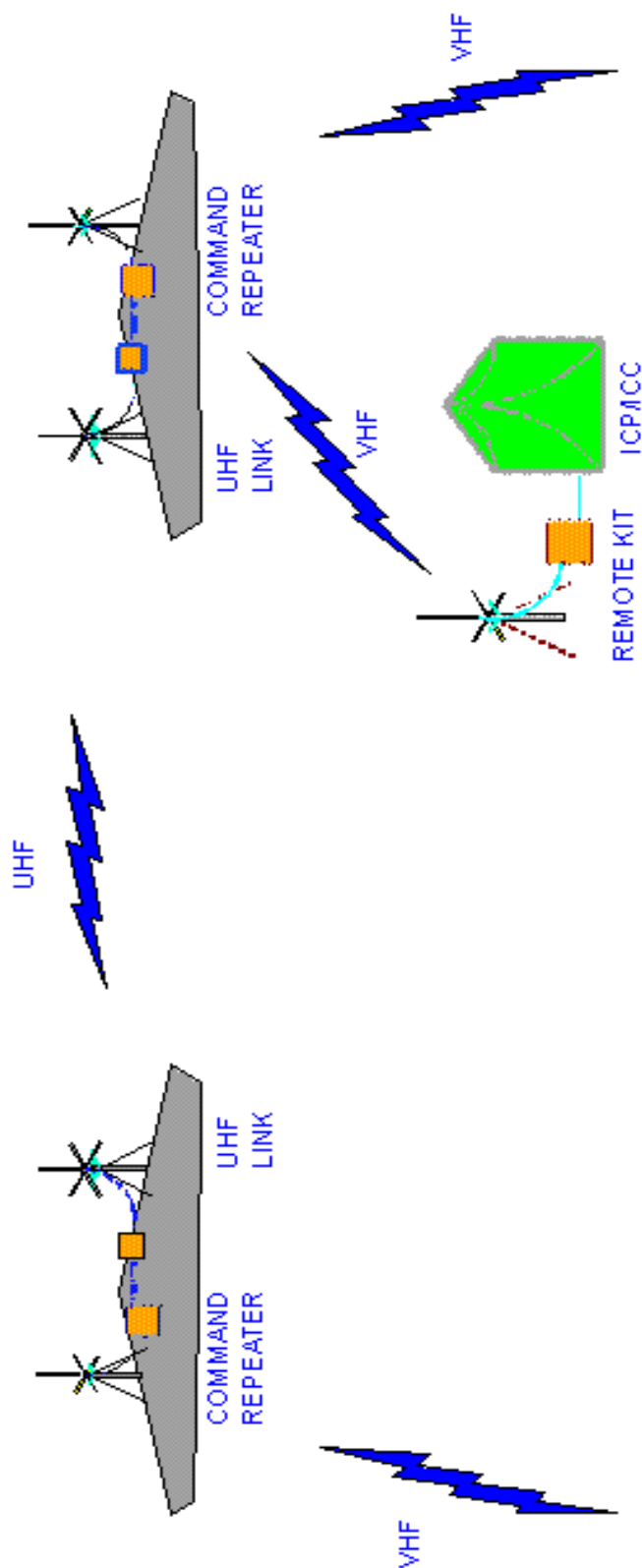


DRAWING 4

## LARGE INCIDENT OPERATIONS AREA LINKING SYSTEM

2 EA. 4312 COMMAND REPEATER  
2 EA. 4253 UHF LINK KIT  
1 EA. 4330 REMOTE KIT

NOTE: SHOULD SPECIFY REPEATER  
FREQUENCIES WHEN ORDERING.



A SYSTEM OF REPEATERS AND LINKS THAT EXTENDS COMMUNICATIONS  
COVERAGE FOR AN INCIDENT WHICH HAS A LARGE OPERATIONAL AREA.  
FREQUENCY COORDINATION WITH COMC OR CDC REQUIRED.  
NOTE: THIS SYSTEM LINKS TWO (2) DIFFERENT COMMAND FREQUENCIES.

INCIDENT OPERATIONS AREA

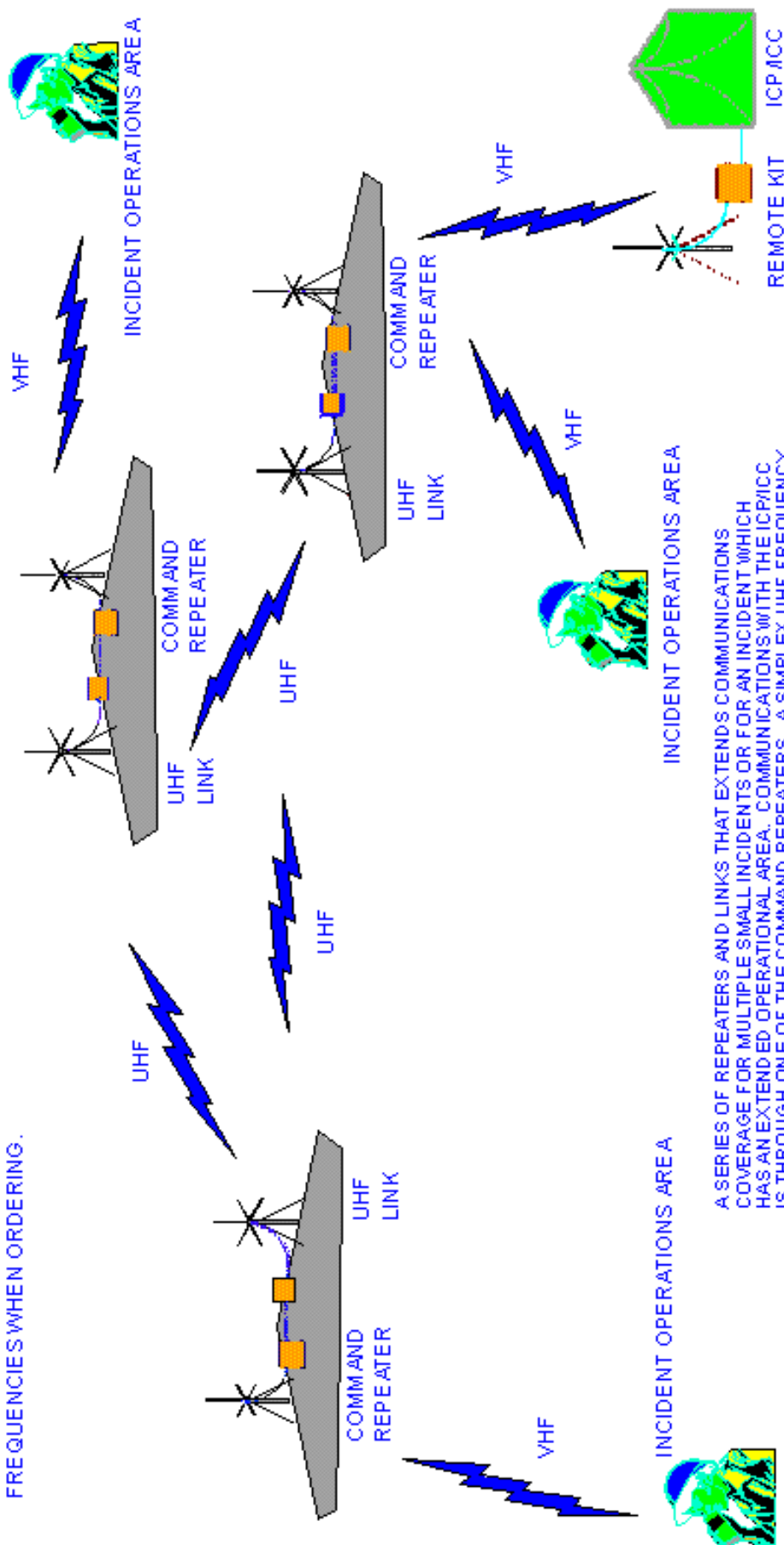
INCIDENT OPERATIONS AREA

DRAWING 5

# EXTENDED OR MULTIPLE INCIDENT OPERATIONS AREA LINKING SYSTEM

3 EA. 4312 COMMAND REPEATER  
3 EA. 4253 UHF LINK KIT  
1 EA. 4330 REMOTE KIT

NOTE: SHOULD SPECIFY REPEATER FREQUENCIES WHEN ORDERING.



A SERIES OF REPEATERS AND LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR MULTIPLE SMALL INCIDENTS OR FOR AN INCIDENT WHICH HAS AN EXTENDED OPERATIONAL AREA. COMMUNICATIONS WITH THE ICP/MCC IS THROUGH ONE OF THE COMMAND REPEATERS. A SIMPLEX UHF FREQUENCY LINKS THE SYSTEM. ADDITIONAL REPEATERS AND LINKS CAN BE ADDED AS LONG AS THEY ARE LINE-OF-SIGHT WITH ALL OTHER UHF LINKS. FREQUENCY COORDINATION WITH COMC OR CDC REQUIRED. NOTE: EACH COMMAND REPEATER IS A DIFFERENT FREQUENCY.

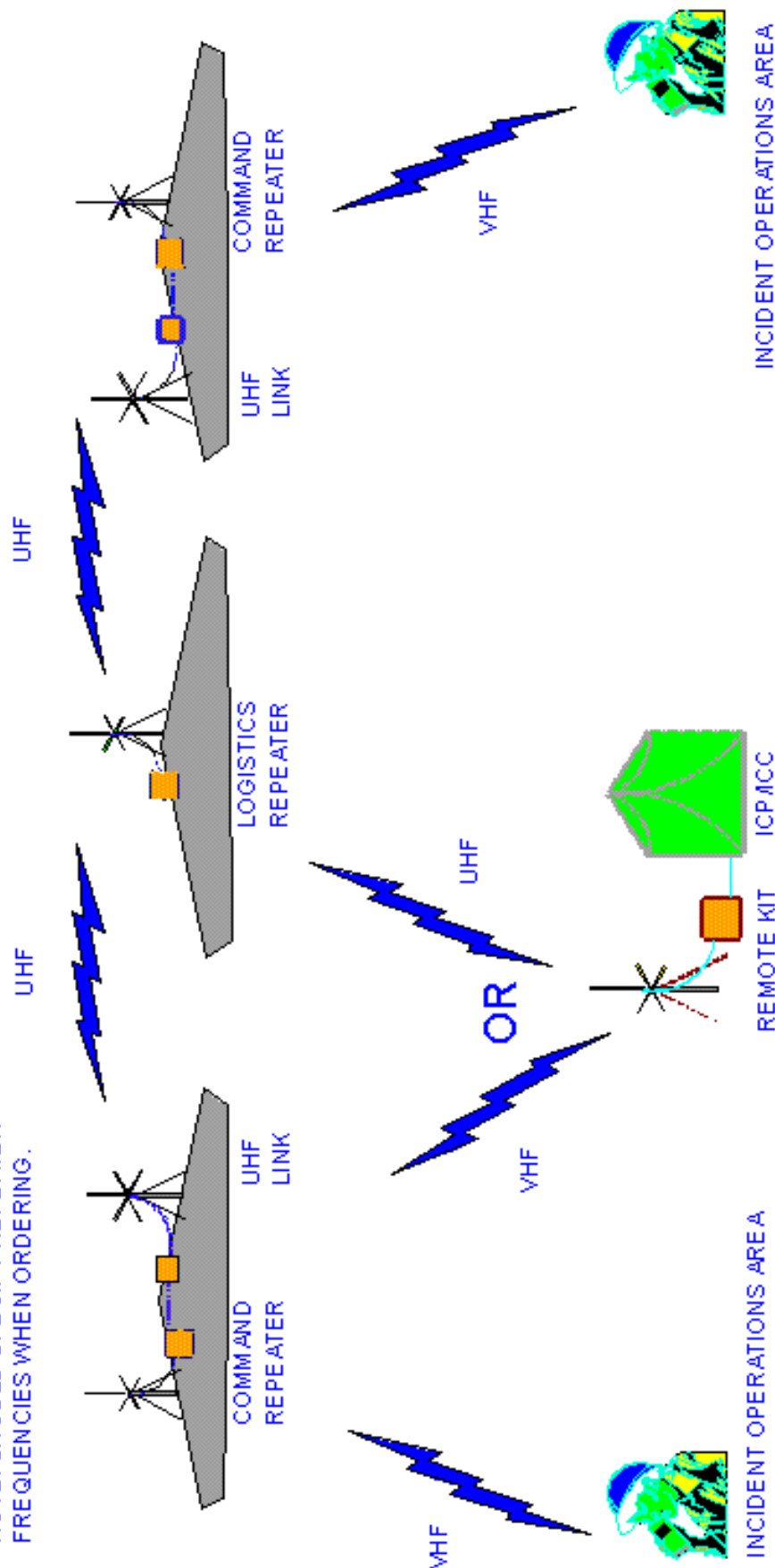
DRAWING 6



# EXTENDED INCIDENT OPERATIONS AREA LINKING SYSTEM

- 2 EA. 4312 COMMAND REPEATER
- 2 EA. 4253 UHF LINK KIT
- 1 EA. 4330 REMOTE KIT
- 1 EA. 4248 LOGISTIC REPEATER

NOTE: SHOULD SPECIFY REPEATER  
FREQUENCIES WHEN ORDERING.



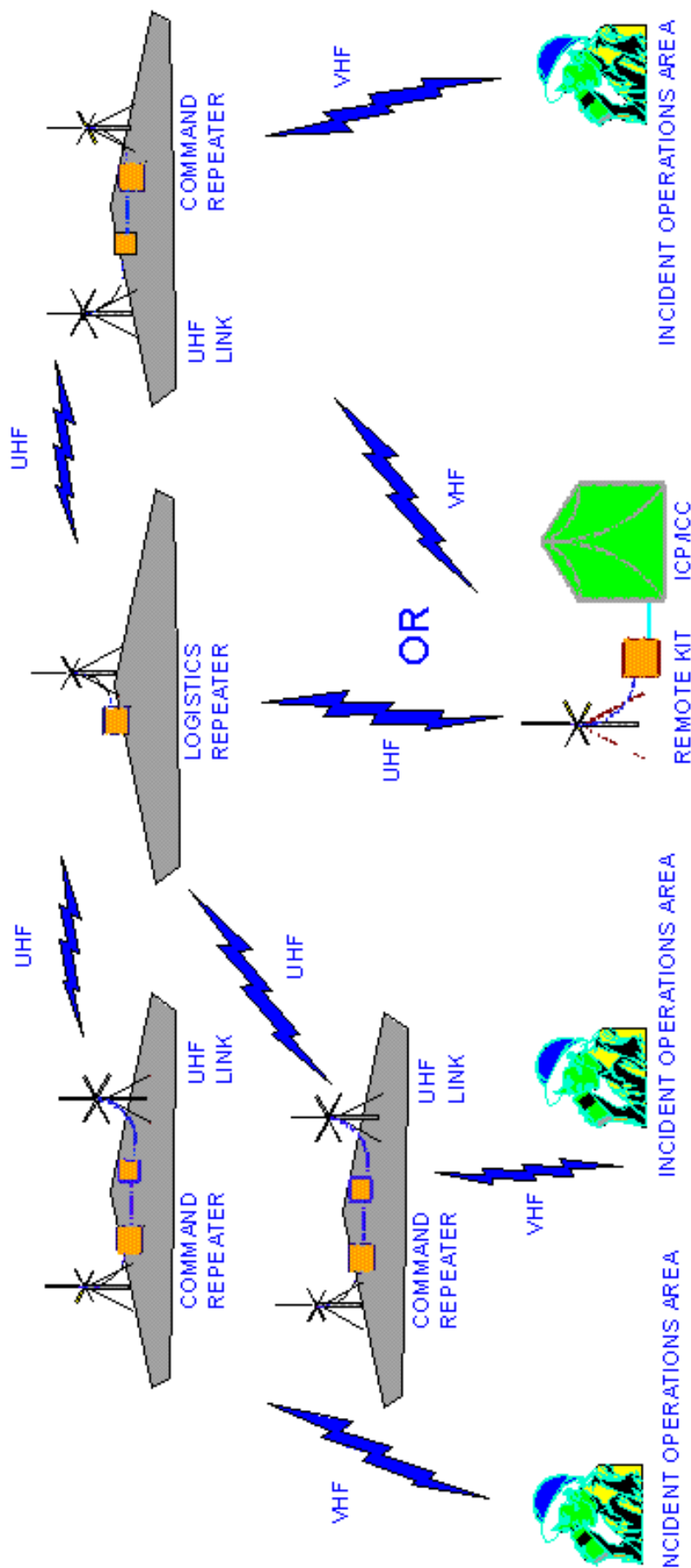
A SYSTEM OF REPEATERS AND LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR AN INCIDENT WHICH HAS AN EXTENDED OPERATIONAL AREA, OR WHERE NEITHER COMMAND REPEATER IS LINE-OF-SIGHT TO THE ICPACC, BUT CAN BE LINKED BY USING A LOGISTICS REPEATER AT AN INTERMEDIATE SITE. FREQUENCY COORDINATION WITH COMC OR CDO IS REQUIRED. NOTE, THIS SYSTEM LINKS TWO (2) DIFFERENT COMMAND FREQUENCIES AND ONE (1) LOGISTICS FREQUENCY.

DRAWING 7

# EXTENDED OR MULTIPLE INCIDENT OPERATIONS AREA LINKING SYSTEM

NOTE: SHOULD SPECIFY REPEATER FREQUENCIES WHEN ORDERING.

- 3 EA. 4312 COMMAND REPEATER
- 3 EA. 4253 UHF LINK KIT
- 1 EA. 4330 REMOTE KIT
- 1 EA. 4248 LOGISTIC REPEATER



A SERIES OF REPEATERS AND LINKS THAT EXTENDS COMMUNICATIONS COVERAGE FOR MULTIPLE SMALL INCIDENTS OR FOR AN INCIDENT WHICH HAS AN EXTENDED OPERATIONAL AREA. COMMUNICATIONS WITH THE ICP/ACC MAY BE THROUGH ONE OF THE COMMAND REPEATERS OR THROUGH THE LOGISTICS REPEATER WHICH LINKS THE ENTIRE SYSTEM. ADDITIONAL REPEATERS AND LINKS CAN BE ADDED, AS LONG AS THEY ARE LINE-OF-SIGHT WITH THE LOGISTICS REPEATER. FREQUENCY COORDINATION WITH COMC OR CDO IS REQUIRED. NOTE: EACH COMMAND REPEATER IS A DIFFERENT FREQUENCY.

DRAWING 8

# AVIATION COMMUNICATIONS CONDITIONS & SOLUTIONS

Aircraft Equipment Conditions.....36

Drawing#:

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(as base station)..... 38

(10) Ground to Aircraft Radio/Link Kit  
(using linking).....39

(11) Ground to Aircraft Radio/Link  
(extended range with 2 kits)..... 40

## **AIRCRAFT EQUIPMENT CONDITIONS**

<b>CONDITIONS</b>	<b>EQUIPMENT SOLUTION</b>	<b>NFES#</b>	<b>DWG#</b>
Ground/Air for Forest Health Protection Projects Ground VHF-AM Base Station Kit	<b>Ground VHF-AM Base Station Kit</b> For Forest Health Protection projects and incidents needing VHF-AM base station capabilities. This kit includes four (4) ICOM handheld radios. VHF-AM frequency used in kit must be cleared/authorized.	4300	9
Need helibase/airport ground to aircraft communications (VHF-AM).	<b>Ground Aircraft Radio/Link Kit</b>  <b>Base Station use only:</b> Will communicate directly with aircraft, without modification, on VHF-AM frequencies. Dedicated frequency should be ordered/cleared by Expanded Dispatch/RO/NIRSC. All kits include four (4) programmable ICOM radios. (Kit is used as a base station, without the link, in this instance.)	4370	9
Helibase/helispot personnel must communicate with incident aircraft in remote locations, as well as flight -follow to/from the operations area and the helibase or helispots. (UHF-FM to VHF-AM)	<b>Ground Aircraft Radio/Link Kit utilizing Link capability:</b> Allows helispot personnel using VHF-AM ICOM or UHF-FM radios to communicate with aircraft on VHF-AM frequencies. Kit also enables non-contract or military aircraft to communicate with other incident aircraft and helispot personnel via VHF-AM frequencies and helibase personnel via UHF-FM through the link.  Dedicated VHF-AM and UHF-FM frequencies must be ordered/cleared by Expanded Dispatch/RO/NIRSC. A VHF radio can be substituted on the link side. Call NIICD CDO for assistance.  Each kit includes four (4) handheld programmable ICOM radios.	4370	10

## **AIRCRAFT EQUIPMENT CONDITIONS**

<b>CONDITIONS</b>	<b>EQUIPMENT SOLUTION</b>	<b>NFES#</b>	<b>DWG#</b>
Extensive flight-following needs require expansion of Radio/Link Kit system utilizing two (2) kits.	<p><b>Ground Aircraft Radio/Link Kit</b> By using two (2) Ground Aircraft Radio/Link Kits linked on a single UHF-AM frequency, flight-following capabilities can be greatly expanded.</p> <p>This design uses one (1) UHF-FM and two (2) VHF-AM frequencies. Helibase must flight-follow using the UHF-FM side of the system.</p> <p>Dedicated VHF-AM and UHF-FM frequencies must be ordered through Expanded Dispatch.</p> <p>A VHF radio can be substituted on the link side. Call NIICD CDO for assistance and clearance of frequencies for assignment.</p> <p>Each kit includes four (4) handheld programmable ICOM radios.</p>	4370	11

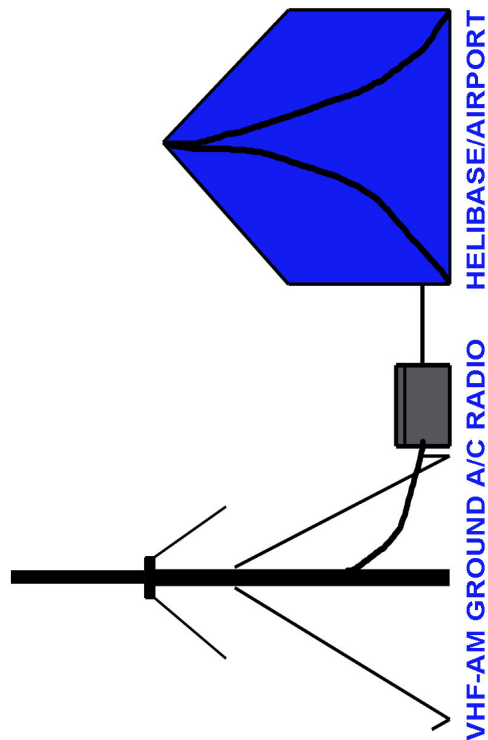
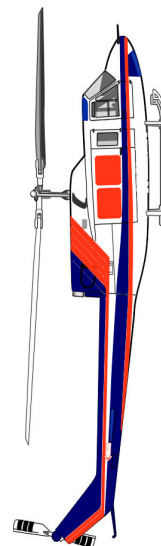
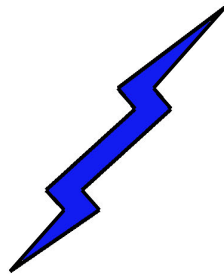
## GROUND TO AIRCRAFT COMMUNICATIONS

EXCLUSIVE INCIDENT FAA FREQUENCY  
SHOULD BE ORDERED THROUGH  
EXPANDED DISPATCH.

1 EA. 4370 GROUND A/C RADIO/LINK KIT  
(INCLUDES 4 EA ICOM HANDHELDS)

OR

1 EA. 4300 GROUND VHF-AM RADIO/BASE KIT  
(INCLUDES 4 EA ICOM HANDHELDS)

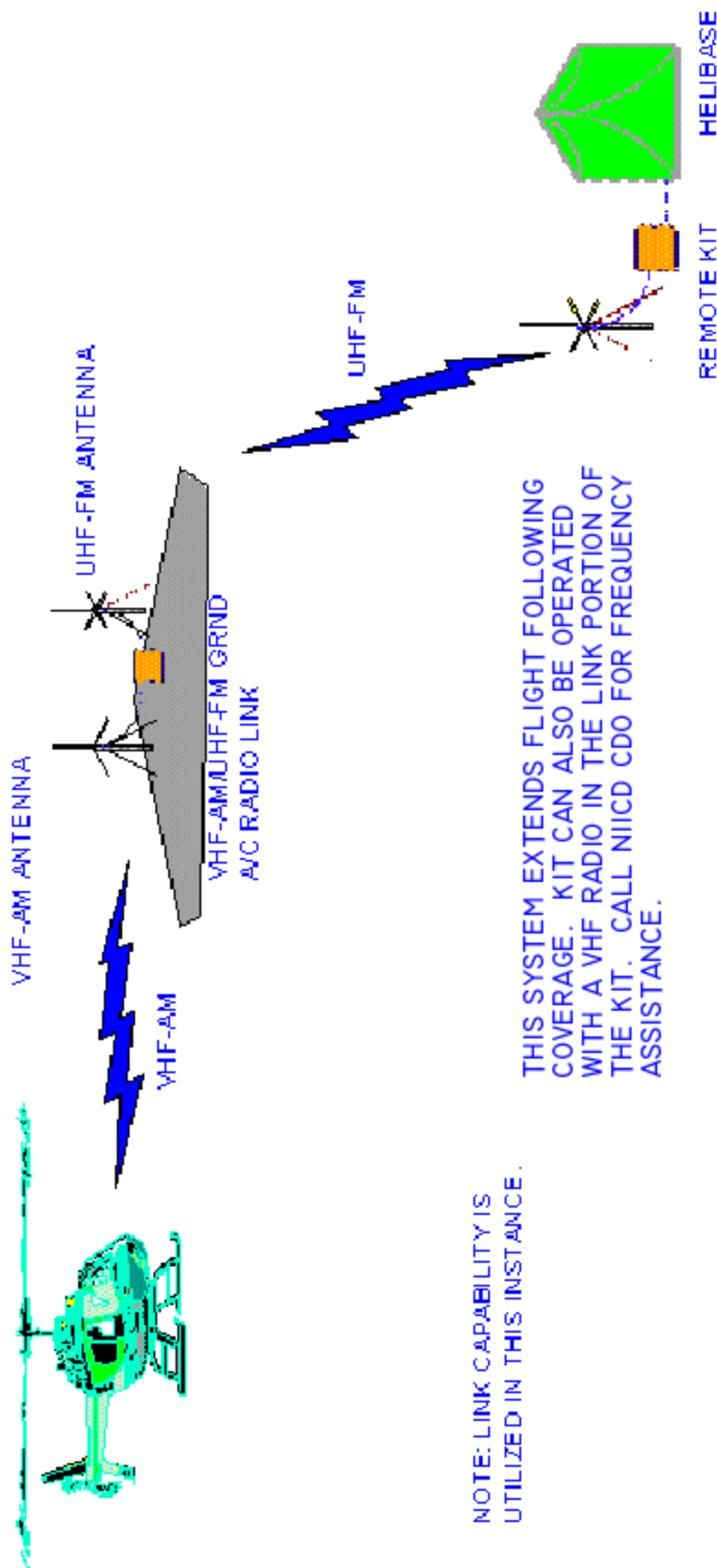


DRAWING 9

## GROUND TO AIRCRAFT COMMUNICATIONS VHF-AM/UHF-FM LINK KIT

- 1 EA. 4370 GROUND A/C RADIO/LINK KIT  
(INCLUDES 4 EA. ICOM HAND HELDS)
- 1 EA. 4380 REMOTE KIT

EXCLUSIVE INCIDENT FAA FREQUENCY  
SHOULD BE CLEARED/ORDERED THROUGH  
EXPANDED DISPATCH.

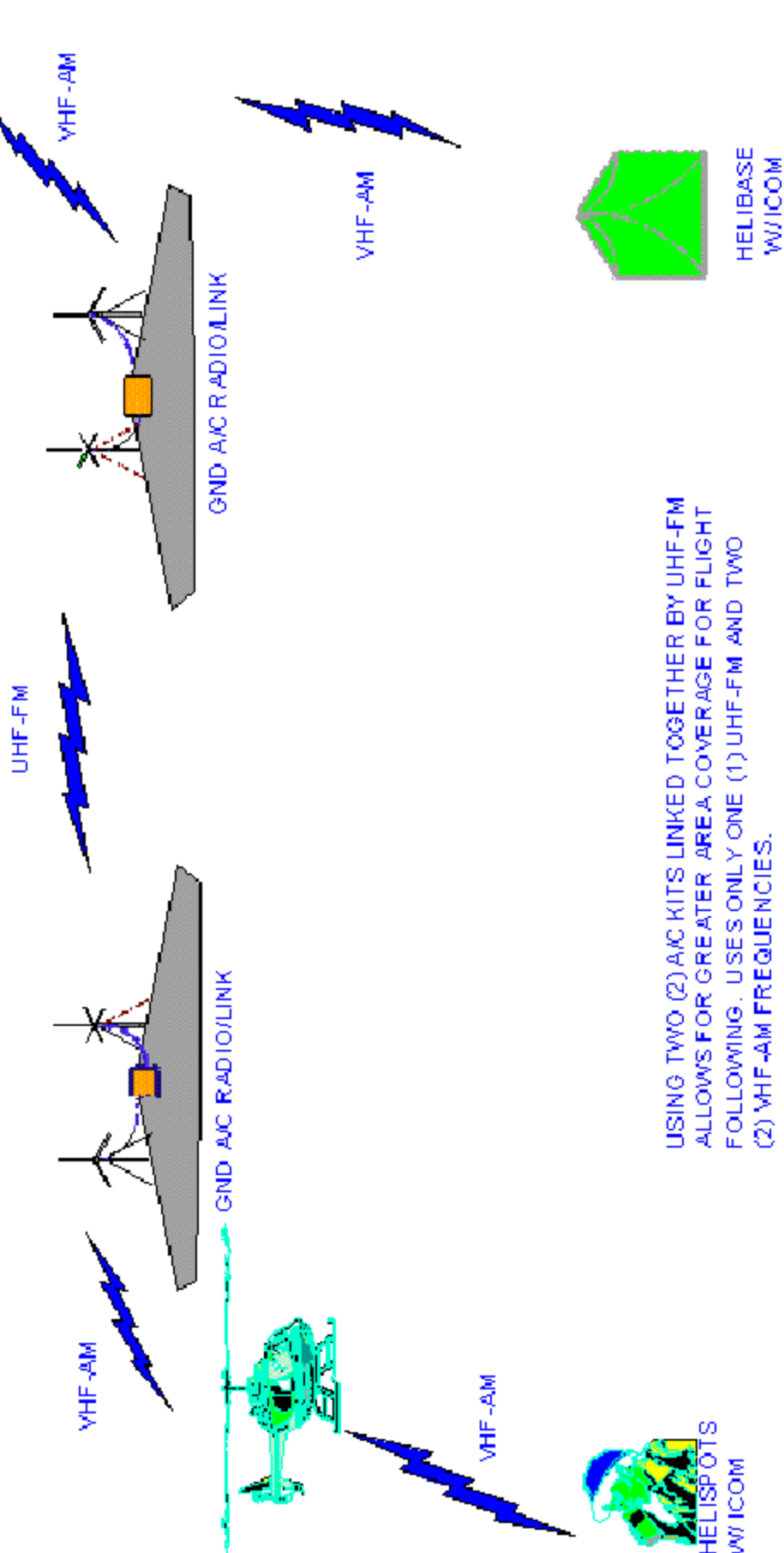


DRAWING 10

# GROUND/AIRCRAFT COMMUNICATIONS VHF-AM/UHF-FM LINK KIT

2 EA. 4370 GND A/C RADIO/LINK KIT  
(INCLUDES 4 EA. ICOM HANDHELDS)  
1 EA. 4330 REMOTE KIT

EXCLUSIVE INCIDENT FAA FREQUENCY  
SHOULD BE CLEARED/ORDERED THROUGH  
EXPANDED DISPATCH.



USING TWO (2) A/C KITS LINKED TOGETHER BY UHF-FM  
ALLOWS FOR GREATER AREA COVERAGE FOR FLIGHT  
FOLLOWING. USES ONLY ONE (1) UHF-FM AND TWO  
(2) VHF-AM FREQUENCIES.

DRAWING 11



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4390	ICS STARTER SYSTEM.....	52
4410	Public Address Kit.....	53
4499	Air Attack Kit.....	54
MAFFS	Kit.....	55

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4244 LOGISTICS RADIO KIT  
(KING & MOTOROLA XTS-3000 UHF RADIOS)**

<b>TOTAL</b>	<b>WEIGHT</b>	<b>CUFT</b>	<b>DIMENSIONS</b>
BOX	75 LBS	3.5	20"X21"X15"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
4306	LINER, FOAM, RADIO KIT	1 EA
	KIT INVENTORY SHEETS	3 EA
	LEAD BOX SEALS	2 EA
	RADIO TRACKING SHEETS	3 EA
	FREQUENCY SHEETS	3 EA
	T-CARDS, RADIO TRACKING	
	<b>KING</b>	
4404	RADIO, KING (CAPITALIZED)	16 EA
	<b>SUBKIT - 4246</b>	
1034	CLAMSHELL BATTERY, REUSEABLE	16 EA
0030	BATTERY, AA	12 PKG
5340	ANTENNA, HELICAL, KING	19 EA
5331	HOLSTER, RADIO, KING	16 EA
5330	SPEAKER, MIC, KING	4 EA
4355	ANTENNA, MOBILE MAG	4 EA
5350	ADAPTER ANTENNA, MOBILE MAG	4 EA
5353	GUARD, KYBRD/FCPLT, KING	16 EA
	<b>MOTOROLA</b>	
	RADIO, MOT, XTS-3000 (CAPITALIZED)	16 EA
	<b>SUBKIT - 4539</b>	
0030	BATTERIES, AA	16 PKG
4540	ANTENNA, UHF , XTS-3000	19 EA
4542	HOLSTER, LEATHER, XTS-3000	16 EA
4541	HOLDER, BATTERY, XTS-3000	16 EA
4543	SPEAKER, MIC, XTS-3000	4 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4248 LOGISTICS REPEATER (DANIELS)**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	95 LBS	4.5	
<b>BOX</b>	80 LBS	3.5	20"X21"X15"
<b>MASTS</b>	15 LBS	1.0	60"X3"X3"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
1023	BATTERIES, 7.5 VOLT	4 EA
4297	DUPLEXER, UHF	1 EA
4333	WIRE ASSEMBLY, FUSED DC	1 EA
0825	TENT STAKES	3 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
4303	HAMMER, 4 LB	1 EA
4304	ANTENNA, UHF, WHIP W/ LOAD	1 EA
4489	BASE, ANTENNA UHF W/GRND PLANES & WRENCH	1 EA
4308	GUY ASSEMBLY, ANTENNA	1 EA
4326	CABLE, COAXIAL W/2 EA 4327 (PL-259)	1 EA
4339	ADAPTER, BARREL CONNECTOR	1 EA
	POWER CORD, W/FEMALE CINCH CONNECTOR	1 EA
	STRAPS, BATTERY (Daniels), 1 RED/BLK, 1 BLK, 1 RED	3 EA
	BATTERY JUMPERS, 4-RED, 4-BLACK	8 EA
	FUSES, 3 AG 5 AMP	1 BX
	GARBAGE BAG	1 EA
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
	ALLEN WRENCH	1 EA
	KIT INVENTORY WORKSHEETS	3 EA
	LEAD BOX SEAL	2 EA
	INSTALLATION INSTRUCTIONS	3 EA
	4247 SUBKIT, CHASSIS (DANIELS)	
4651	SUBRACK	1 EA
4667	MODULE, SYSTEM MONITOR	1 EA
4650	MODULE, AUDIO CONTROL	1 EA
4655	MODULE, TRANSMITTER, UHF	1 EA
4656	MODULE, RECEIVER, UHF	1 EA
4659	MICROPHONE, DANIELS	1 EA
4690	SCREWDRIVER, DANIELS	1 EA
4305	MASTS, ANTENNA 5 FT SECTION	3 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4253 UHF LINK KIT**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	95 LBS	4.5	
<b>BOX</b>	80 LBS	3.5	20"X21"X15"
<b>MASTS</b>	15 LBS	1.0	60"X3"X3"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
1023	BATTERY, 7.5 VOLT	4 EA
0825	TENT STAKES	3 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
4303	HAMMER, 4 LB	1 EA
4308	GUY ASSEMBLY, ANTENNA	2 EA
4326	CABLE, COAXIAL, W/2 EA 4327 (PL-259)	1 EA
4339	ADAPTER, COAXIAL, BARREL	1 EA
4304	ANTENNA, UHF WHIP, W/PO-UHF LOAD	1 EA
4489	BASE, ANTENNA W/GRD PLANES	1 EA
5208	ANTENNA, YAGI W/U-BOLT, CLAMP, NUTS.	1 EA
4180	CONNECTOR, 90 DEGREES, UHF	1 EA
	BATTERY STRAPS, (DANIELS) 15 VOLT	3 EA
	BATTERY JUMPERS, 4-RED, 4 BLACK	8 EA
	GARBAGE BAG	1 EA
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
	ALLEN WRENCH	1 EA
	FUSES, 3AG 5 AMP (1 BOX)	5 EA
	KIT INVENTORY WORKSHEETS	3 EA
	LEAD BOX SEAL	2 EA
	INSTALLATION INSTRUCTION SHEETS	3 EA
4305	MASTS, ANTENNA 5 FT SECTION	3 EA
	<b>4254 SUBKIT, (DANIELS)</b>	
4310	LINER, FOAM, 2-POCKET	1 EA
4660	MODULE, DANIELS, SYN, UHF-TX	1 EA
4661	MODULE, DANIELS, SYN, UHF-RX	1 EA
4670	CABLE, COAX, RCVR TO MONITOR	1 EA
2098	CABLE, COAX, XTMR TO MONITOR	1 EA
4690	SCREWDRIVER, DANIELS	1 EA
	BATTERY JUMPERS, 6 FT, 1-RED, 1-BLACK	2 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4281 CROSSBAND LINK (DANIELS)**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	95 LBS	4.5	
<b>BOX</b>	80 LBS	3.5	20"X21"X15"
<b>MASTS</b>	15 LBS	1.0	60"X3"X3"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
1023	BATTERY, 7.5 VOLT	4 EA
0825	TENT STAKES	3 EA
4303	HAMMER, 4 LB	1 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
4308	GUY ASSEMBLY, ANTENNA	2 EA
4326	CABLE, COAXIAL, W/2 EA 4327 (PL-259)	2 EA
4464	ANTENNA, VHF WHIP, W/PO-150 LOAD	1 EA
4339	ADAPTER, COAXIAL, BARREL	2 EA
4304	ANTENNA,UHF WHIP	1 EA
4489	BASE ANTENNA, UHF, W/GRND PLANES	1 EA
4489	BASE ANTENNA, VHF, W/GRND PLANES	1 EA
5208	ANTENNA, YAGI	1 EA
4333	WIRE ASSEMBLY, FUSED	1 EA
4180	CONNECTOR, 90 DEGREE, UHF	2 EA
	JUMPERS, BATTERY, 6 FT	2 EA
	POWER CORD W/FEMALE CINCH CONNECTOR	1 EA
	BATTERY JUMPERS, 4-RED, 4 BLACK	8 EA
	FUSES, 3AG 5 AMP (1 BOX)	5 EA
	BATTERY STRAPS, 1-LONG, 2-SHORT	3 EA
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
	ALLEN WRENCH	1 EA
	LEAD BOX SEAL	2 EA
	GARBAGE BAG	1 EA
	KIT INVENTORY WORKSHEETS	3 EA
	INSTALLATION INSTRUCTION SHEETS	3 EA
4305	MASTS, ANTENNA 5 FT SECTION	3 EA
4690	SCREWDRIVER, DANIELS	1 EA
4651	SUBRACK, DANIELS (19')`	1 EA
4657	TRANSMITTER, UHF, SYN	1 EA
4658	RECEIVER, UHF, SYN	1 EA
4660	TRANSMITTER,SYN, VHF	1 EA
4661	RECEIVER, SYN, VHF	1 EA
4668	CABLE, RECEIVER, A-SIDE	1 EA
4669	CABLE, TRANSMITTER, A-SIDE	1 EA
4678	CABLE, COAX, B-SIDE (RECVR TO MONITOR)	1 EA
4679	CABLE, COAX, B-SIDE (XMITTER TO MONITOR)	1 EA
4675	MODULE, CONTROL	1 EA
4659	MICROPHONE, DANIELS	1 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4300 GROUND VHF-BASE STATION**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	95 LBS	4.5	
<b>BOX</b>	80 LBS	3.5	20"X21"X15"
<b>MASTS</b>	15 LBS	1.0	60"X3"X3"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
4307	LINER, A/C, 5-POCKET	1 EA
1023	BATTERY, 7.5 VOLT	4 EA
0825	TENT STAKES	6 EA
4303	HAMMER, 4 LB	1 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
4308	GUY ASSEMBLY, ANTENNA	1 EA
4326	CABLE, COAXIAL, W/2 EA 4327 (PL-259)	1 EA
0332	WRENCH, ADJUSTABLE, 6"	1 EA
4343	ANTENNA, VHF AM, AV-1 W-BAND	1 EA
4339	ADAPTER, COAXIAL, BARREL	1 EA
	N.MALE TO UHF FEM. ADAPTR. (RFN-1035-1)	1 EA
	120 VOLT AC POWER CORD (TBS-150)	1 EA
	ADAPTER, CAR BATT, FEMALE TO BATT. CONN.	1 EA
	ADAPTER, CAR BATT, MALE TO 2 HOLE (TBS-150)	1 EA
	BATTERY JUMPERS, 4-RED, 4 BLACK	8 EA
	BATTERY STRAPS, 1-RED/BLK, 1-RED, 1-BLK	3 EA
	FUSES, 2AG 5 AMP MINI (1 BOX)	5 EA
	FUSES, 3AG 5 AMP (1 BOX)	5 EA
	FUSES, MDL, 2.5 AMP (1 BOX)	5 EA
	KIT INVENTORY WORKSHEETS	3 EA
	INSTALLATION INSTRUCTION SHEETS	3 EA
	FREQUENCY SHEETS FOR ICOMS	4 EA
	LEAD BOX SEAL	2 EA
	GARBAGE BAG	1 EA
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
0030	BATTERY, AA	80 EA
5083	CLAMSHELL, BATTERY, REUSEABLE	4 EA
5084	HOLSTER, RADIO, ICOM	4 EA
5082	ANTENNA, ICOM, HANDHELD, HELICAL	5 EA
	OPERATING BOOKLET, ICOM	4 EA
2098	T-CARDS, RADIO TRACKING	8 EA
4305	MASTS, ANTENNA 5 FT SECTION	6EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4312 COMMAND REPEATER (DANIELS)**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	110 LBS	4.5	
<b>BOX</b>	95 LBS	3.5	20"X21"X15"
<b>MASTS</b>	15 LBS	1.0	60"X3"X3"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
1023	BATTERIES, 7.5 VOLT	4 EA
4342	DUPLEXER, VHF	1 EA
0825	TENT STAKES	3 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
4303	HAMMER, 4 LB	1 EA
4464	ANTENNA, VHF, WHIP W/PO-150 LOAD	1 EA
4489	BASE, ANTENNA VHF W/GRND PLANES & WRENCH	1 EA
4308	GUY ASSEMBLY, ANTENNA	1 EA
4326	CABLE, COAXIAL W/2 EA 4327 (PL-259)	1 EA
4333	WIRE ASSEMBLY, FUSED (MX)	1 EA
4339	ADAPTER, BARREL CONNECTOR	1 EA
	POWER CORD W/FEMALE CINCH CONNECTOR	1 EA
	STRAPS, BATTERY 15 VOLT (DANIELS), 1 RED/BLK, 1 RED, 1 BLK	
	1-RED, 1-BLACK	3 EA
	BATTERY JUMPERS, 4-RED, 4-BLACK	8 EA
4690	SCREWDRIVER,DANIELS	1 EA
	FUSES, 3 AG 5 AMP	1 BX
	GARBAGE BAG	1 EA
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
	ALLEN WRENCH	1 EA
	KIT INVENTORY WORKSHEETS	3 EA
	LEAD BOX SEAL	2 EA
	INSTALLATION INSTRUCTIONS	3 EA
0968	USER'S GUIDE	1 EA
4649	SUBKIT, DANIELS	
4651	SUBRACK	1 EA
4652	SYSTEM MONITOR	1 EA
4653	TRANSMITTER VHF	1 EA
4654	RECEIVER VHF	1 EA
4657	TRANSMITTER, VHF (SYN)	1 EA
4658	RECEIVER, VHF (SYN)	1 EA
4650	AUDIO CONTROL	1 EA
4659	MICROPHONE, DANIELS	1 EA
4305	MASTS, ANTENNA 5 FT SECTION	3 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4330 REMOTE KIT**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	105 LBS	4.5	
<b>BOX</b>	95 LBS	3.5	20"X21"X15"
<b>MASTS</b>	15 LBS	1.0	60"X3"X3"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
4331	KIT, REMOTE CHASSIS	1 EA
1233	BATTERY, 6 VOLT HOT SHOT	2 EA
4332	WIRE, FIELD TELEPHONE, 1/4 MILE REEL	1 RO
0825	TENT STAKES	3 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
4303	HAMMER, 4 LB	1 EA
4464	ANTENNA, VHF, WHIP W/PO-150 LOAD	1 EA
4304	UHF WHIP W/LOAD	1 EA
4489	BASE, ANTENNA W/GRND PLANES & WRENCH, 1 EA UHF, VHF	2 EA
5208	ANTENNA, YAGI W/U-BOLT, CLAMP, NUTS	1 EA
4308	GUY ASSEMBLY, ANTENNA	1 EA
4326	CABLE, COAXIAL W/2 EA 4327 (PL-259)	1 EA
4339	ADAPTER, BARREL CONNECTOR	1 EA
4302	WIRE ASSEMBLY, FUSED DC 1 AMP	1 EA
0325	PLIERS, LINEMAN	1 EA
4180	CONNECTOR, 90 DEGREE, UHF	1 EA
4274	A/C D/C TRANSFORMER	1 EA
4409	SPEAKER,EXTERNAL 8-OHM	1 EA
	GARBAGE BAG	1 EA
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
	ALLEN WRENCH	1 EA
	KIT INVENTORY WORKSHEETS	3 EA
	LEAD BOX SEAL	2 EA
	INSTALLATION INSTRUCTIONS	3 EA
	FUSES 1 AMP ( <b>FOR TELEPHONE ONLY</b> )	1 BX
	WIRE NUTS	6 EA
	BATTERY, JUMPERS, 3 RED, 3 BLACK	6 EA
	<b>4331 KIT, REMOTE CHASSIS</b>	
4471	BOX, REMOTE CHASSIS	1 EA
5327	CABLE, ACCESSORY, KING W/ANT	1 EA
4084	CONNECTOR, RND 9 PIN FEMALE	3 EA
4096	CONNECTOR, RND 9 PIN MALE	1 EA
4472	REMOTE, CHASSIS	1 EA
4305	MASTS, ANTENNA 5 FT SECTIONS	3 EA
	FUSE 5 AMP ( <b>FOR CHASSIS ONLY</b> )	1 EA



**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4370 GROUND AIRCRAFT RADIO/LINK KIT**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	145 LBS	5.5	
<b>BOX</b>	115 LBS	3.5	20"X21"X15"
<b>MASTS</b>	30 LBS	2.0	60"X6"X6"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS, (RADIO & RPTR)	1 EA
4307	LINER, FOAM, 5-POCKET	1 EA
1023	BATTERY, 7.5 VOLT	4 EA
0825	TENT STAKES	6 EA
4303	HAMMER, 4 LB	1 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
4308	GUY ASSEMBLY, ANTENNA	2 EA
4326	CABLE, COAXIAL, W/2 EA 4327 (PL-259)	2 EA
4339	ADAPTER, COAXIAL, BARREL	2 EA
0332	WRENCH, ADJUSTABLE, 6"	1 EA
4343	ANTENNA, VHF AM, AV-1 W-BAND	1 EA
4304	ANTENNA, UHF WHIP W/BAND LOAD	1 EA
4489	BASE, ANTENNA UHF W/GRND PLANES & WRENCH	1 EA
4180	CONNECTOR, 90 DEGREES	2 EA
4409	SPEAKER, EXTERNAL, 8-OHM	1 EA
0030	BATTERY, AA	4 PG
5083	HOLDER, BATTERY, ICOM	4 EA
5084	HOLSTER, RADIO, LEATHER, ICOM	4 EA
5082	ANTENNA, ICOM	5 EA
2098	T-CARD, RADIO TRACKING	8 EA
4690	SCREWDRIVER, DANIELS	1 EA
4659	MICROPHONE, DANIELS	1 EA
4651	SUBRACK, W/MOTHERBOARD, SR-39-1	1 EA
4660	TRANSMITTER, UHF, SYN, UT-3 / 420-SWC200	1 EA
4661	RECEIVER, UHF, SYN, UR-3 / 420-SWCX00	1 EA
4665	MONITOR, SYSTEM	1 EA
4666	TRANSMITTER,SYNTHESIZED, VHF-AM	1 EA
4667	RECEIVER, SYNTHESIZED, VHF-AM	1 EA
4668	CABLE, RECEIVER, A-SIDE	1 EA
4669	CABLE, TRANSMITTER, A-SIDE	1 EA
4678	CABLE, COAX, B-SIDE (RECVR TO MONITOR)	1 EA
4679	CABLE, COAX, B-SIDE (XMITTER TO MONITOR)	1 EA
4675	CARD, CONTROL, AUDIO (AC-3E)	1 EA
	POWER CORD, W/FEMALE CINCH CONNECTOR	1 EA
	POWER CORD, FE, CINCH TO ALLIGATOR CLIP	1 EA
	BATTERY JUMPERS, 4 RED, 4 BLACK	8 EA
	FUSES 5 AMP 3 AG (5 EACH)	1 BX
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
4402	ICOM VHF-AM RADIOS	4 EA
	LEAD BOX SEAL	2 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4370 GROUND AIRCRAFT RADIO/LINK KIT  
CONTINUED**

<b>NFES #</b>	<b>DESCRIPTION</b>	<b>QTY ISSUED</b>
	GARBAGE BAG	1 EA
	ALLEN WRENCH	1 EA
	BATTERY STRAPS, (15 VOLT)	3 EA
	INSTALLATION INSTRUCTIONS	3 EA
	ANTENNA/BATTERY SETUP INSTRUCTIONS	3 EA
	KIT INVENTORY WORKSHEETS	3 EA
	FREQUENCY SHEET FOR ICOMS	3 EA
	FREQUENCY SHEET, UHF	3 EA
	OPERATING BOOKLET, ICOM	4 EA
4305	MASTS, ANTENNA 5 FT SECTION	6 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4381 CMD/TAC RADIO KIT (KING, RECAL)**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	85 LBS	3.5	20"X21"X15"

<b>NFES #</b>	<b>DESCRIPTION</b>	<b>QTY ISS'D</b>
4309	BOX, FIBERGLASS, (RADIO & RPTR)	1 EA
4306	LINER, FOAM, RADIO KIT	1 EA
	T-CARDS, RADIO TRACKING	32 EA
	KIT INVENTORY WORKSHEETS	3 EA
	LEAD SEALS	2 EA
	RADIO TRACKING SHEETS	3 EA
	FREQUENCY CHARTS	3 EA
	<b>KING</b>	
4322	RADIO, KING CAPITALIZED	16 EA
	<b>4353 - SUBKIT, KING</b>	
5321	ANTENNA, HELICAL ,KING	19 EA
0030	BATTERY, AA	12 PG
1034	BATTERY, CLAMSHELL	16 EA
5331	HOLSTER, RADIO, KING	16 EA
5330	SPEAKER, MIC, KING	4 EA
4355	ANTENNA, MOBILE MAG	4 EA
5350	ADAPTER ANTENNA, MOBILE MAG	4 EA
5353	GUARD, KYBRD/FCPLT, KING	16 EA
	<b>4162 - SUBKIT, RACAL</b>	
4163	ANTENNA, RACAL, VHF	19 EA
0030	BATTERY, AA	14 PKG
4165	HOLDER, AA BATTERY, RACAL	16 EA
4164	HOLSTER, RADIO, RACAL	16 EA
4166	SPEAKER/MIC, RADIO, RACAL	16 EA
4355	MOBILE MAG, W/BNC AND SMA ADAPTER	4 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4390 ICS STARTER SYSTEM (COMMAND/LOGISTICS)**

	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>TOTAL</b>	975 LBS	42.0	
<b>BOXES</b>	905 LBS	35.0	10 EA @ 20"X21"X15"
<b>MASTS</b>	70 LBS	7.0	7 EA @ 60"X3"X3"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4381	CMD/TAC RADIO KIT	3 EA
4312	COMMAND REPEATER	1 EA
4370	GROUND AIRCRAFT RADIO/LINK KIT	1 EA
4330	REMOTE KIT	3 EA
4248	LOGISTICS REPEATER	1 EA
4244	LOGISTICS RADIO KIT	1 EA
4305	MASTS, ANTENNA 5 FT SECTIONS	21 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4410 PUBLIC ADDRESS SYSTEM**

<b>TOTAL</b>	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>BOX</b>	60 LBS	3.5	20"X21"X15"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
4309	BOX, FIBERGLASS	1 EA
1233	BATTERIES, 6 VOLT HOT SHOT	2 EA
4377	WIRE, 1000 FT ROLL	1 RO
5037	MICROPHONE, PA	1 EA
4171	SCREWDRIVER, 6" STRAIGHT SLOT	1 EA
0325	PLIERS, LINEMAN	1 EA
1172	100' EXTENSION CORD	1 EA
4397	AMPLIFIER, PA	1 EA
4063	SPEAKER, PA	3 EA
	GARBAGE BAG	1 EA
	FILAMENT TAPE	1 RO
	FLAGGING TAPE	1 RO
	FUSES, 3 AG 1 AMP	1 BX
	WIRENUTS, SMALL	10 EA
	BATTERY JUMPERS, 3 BLACK, 3 RED	6 EA
	KIT INVENTORY WORKSHEETS	3 EA
	LEAD BOX SEAL	2 EA
	INSTALLATION INSTRUCTIONS	3 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
4499 AIR ATTACK KIT**

<b>TOTAL</b>	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>BOX</b>	35 LBS	3.35	24.5" X 14" X 17"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
	RADIO, A/C MODEL TFM - 138B	1 EA
	RADIO, A/C MODEL, TFM - 136	1 EA
0539	CARTON, FIBERBOARD	1 EA
4479	CHASSIS, AIR ATTACK (MODEL TAK 100)	1 EA
4487	CABLE, POWER	1 EA
4488	CABLE AUDIO/MIC	1 EA
	ADAPTER, HEADSET	2 EA
4486	ADAPTER, PTT, PT-300	2 EA
	CONNECTOR, BARREL, BNC	2 EA
	CAP, CONNECTOR (LARGE)	3 EA
	CAP, CONNECTOR (SMALL)	3 EA
	CAP/CHAIN, BNC	2 EA
	OPERATOR'S GUIDE TFM - 138	1 EA
	OPERATOR'S GUIDE TFM 136	1 EA
4490	STRAP, TIE DOWN	2 EA
	INFORMATION SHEET, AIR ATTACK	1 EA
	INFORMATION SHEET, TFM - 138, RADIO	1 EA

**NATIONAL INCIDENT RADIO SUPPORT CACHE  
MAFFS BASE STATION (TAF-550)**

<b>TOTAL</b>	<b>WEIGHT</b>	<b>CU FT</b>	<b>DIMENSIONS</b>
<b>BOX</b>	35 LBS	3.35	24.5" X 14" X 17"

<b>NFES#</b>	<b>DESCRIPTION</b>	<b>QTY ISSD</b>
	<b>BOX 1</b>	
	RADIO, A/C MODEL TFM - 138B	1 EA
	RADIO, A/C MODEL, TIL - 911 - DE	1 EA
4309	BOX FIBERGLASS	1 EA
	TENT STAKES	6 EA
4303	HAMMER, 4 LB.	1 EA
4308	GUY ASSEMBLY, ANTENNA	2 EA
4464	ANTENNA, VHF, WHIP, W/PO-150 LOAD	2 EA
4489	BASE ANTENNA, VHF W/GRND PLANES	1 EA
4343	ANTENNA, VHF, AM, AV-1 W-BAND	1 EA
	CABLE, CO-AX, W/BNC CONN. (20FT)	4 EA
	ADAPTER, BARREL, CONNECTOR	2 EA
	ADAPTER, BNC TO UHF	2 EA
	HEADSET, S-40	1 EA
	BARREL CONNECTOR, BNC, (RFB-1134)	2 EA
	INFORMATION SHEET, TFM - 138 RADIO	1 EA
	INFORMATION PACKET, TIL-91DE RADIO	1 EA
4305	MAST, ANTENNA, 5 FT. SECTION	6 EA
	<b>BOX 2</b>	
	CARRY CASE W/FOAM LINER	1 EA
4322	RADIO, KING (CAPITALIZED)	8 EA
1034	CLAMSHELL, BATTERY	8 EA
0030	BATTERY, AA	10 PG
5321	ANTENNA, HELICAL KING	8 EA
5331	HOLSTER, RADIO, KING	8 EA
5328	ADAPTER, HELMET, KING TO U-92A/U	6 EA
	HEADSET, DAVID CLARK H10-66	4 EA
	ADAPTER, SIGTRONICS 3900050GA TO U-174/U	2 EA
5330	SPEAKER MIC, KING	4 EA
	T-CARDS, RADIO TRACKING	20 EA

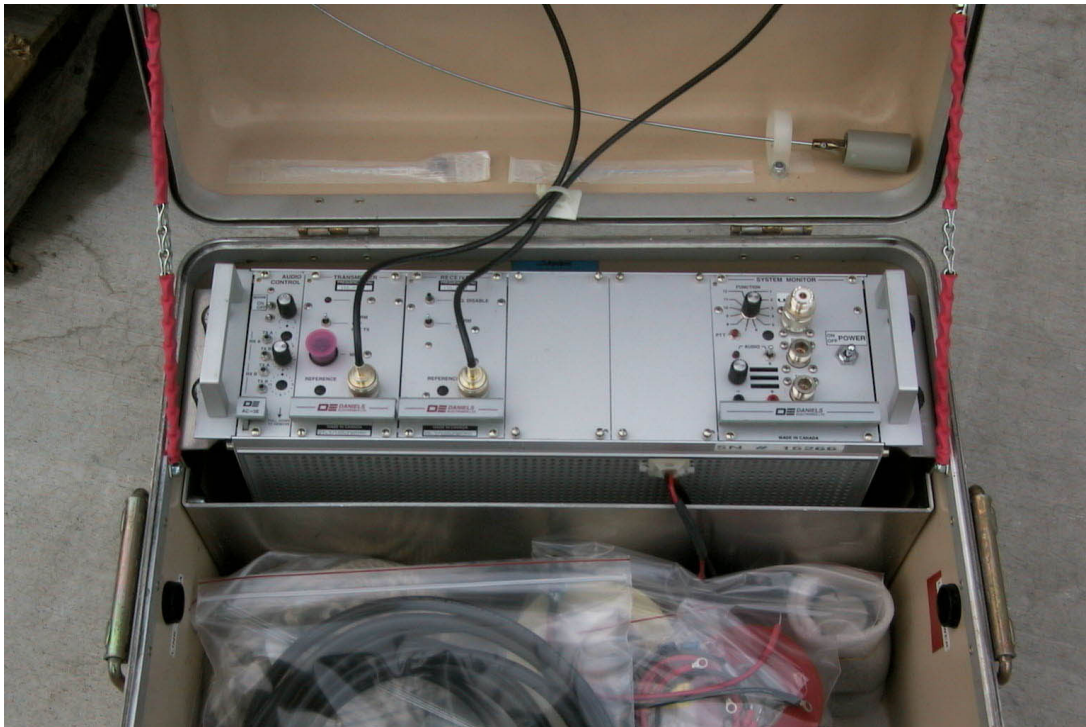
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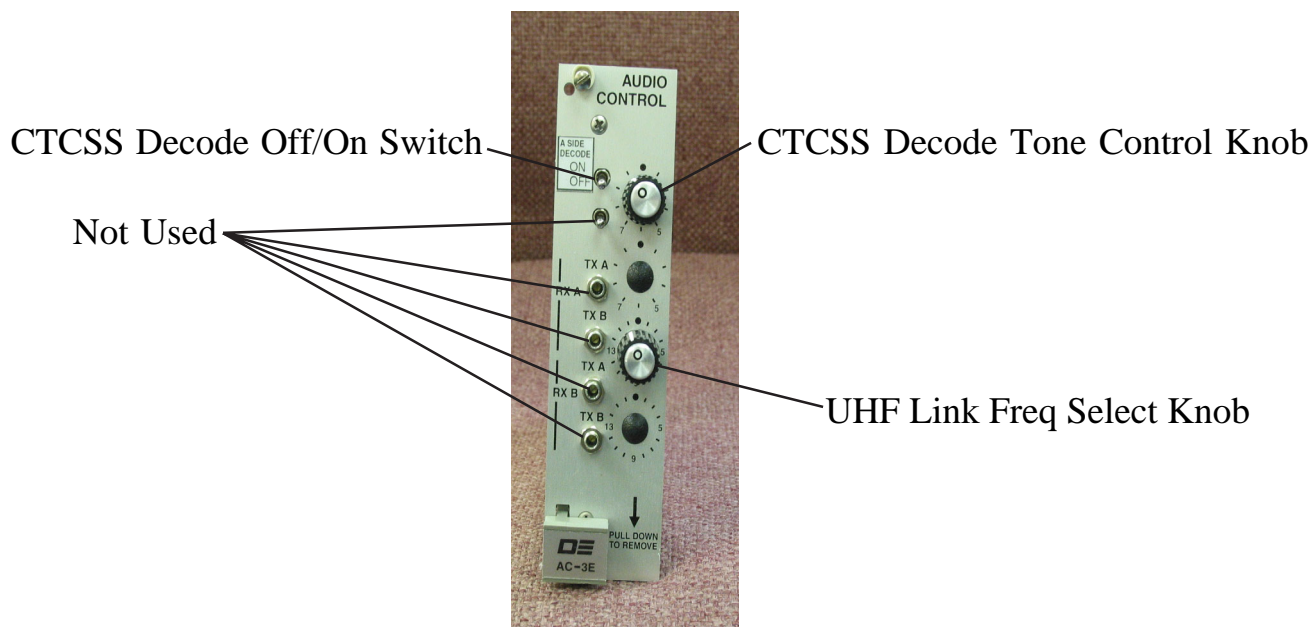
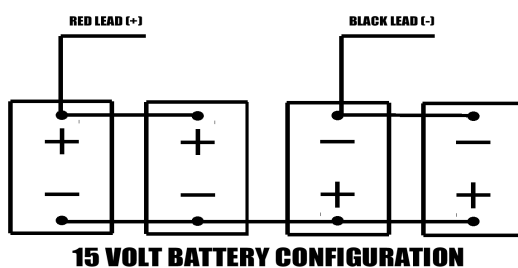
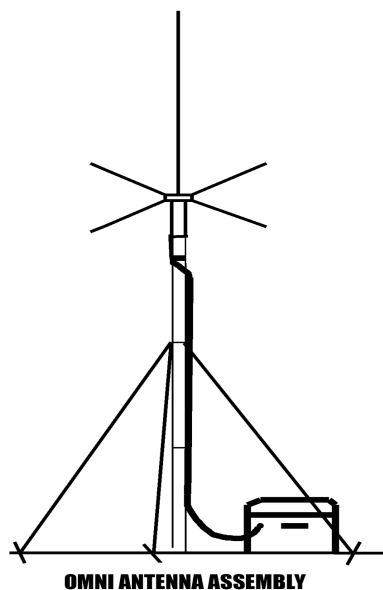
## SET-UP PROCEDURES FOR NIRSC (DANIELS) REPEATERS NFES# 4312 & 4248

1. Battery Supply. The battery is configured with a POLARIZED interconnect plug. If it becomes necessary to replace batteries, follow the battery hook-up illustration on page 78. Reversing polarity will result in an inoperative repeater. The repeater kit is shipped with the polarized plug disconnected and should be plugged in before the repeater is turned on.
2. Antenna Installation. Use the high gain antenna provided. Attach the ground planes.
3. Coaxial Cable. DO NOT leave the cable coiled. Run the coaxial cable through the hole provided in the side of the shipping container. Close the lid tightly to prevent weather and rodent damage to the equipment. Put tape over the hole in the box where the coax comes through to prevent rain from entering the box.



Daniels Repeater

## SET-UP PROCEDURES FOR NIRSC (DANIELS) REPEATERS NFES # 4312 & # 4248



A command repeater audio control card

**UHF LINK KIT (DANIELS)**  
**NFES #4253**

**INSTALLATION INSTRUCTIONS**

**NOTE: This kit is designed to be used in conjunction with a Daniels VHF Command Repeater, NFES# 4312**

DANIELS VHF REPEATERS ARE SENT OUT WITHOUT UHF LINK RADIOS (Modules) INSTALLED. THESE MUST BE INSTALLED IN THE FIELD.

NOTE: A CONFIGURATION DIAGRAM IS PROVIDED WITH EACH UNIT.

1. Install the UHF Link TRANSMITTER Module into Transmitter slot "B" in the Daniels rack. You must first remove the cover plate(s) from the Daniels rack.
2. Install the UHF Link RECEIVER Module into Receiver slot "B" in the Daniels rack. You must first remove the cover plate(s) from the Daniels rack.
3. Connect the provided coax cable (approx. 12") between the TX "B" Module's RF OUT connector and the Antenna Relay in the SYSTEM MONITOR Module. The Antenna Relay TX connector is the lower most connector.
4. Connect the provided coax (approx. 12") between the RECEIVER "B" Module's RF IN connector and the Antenna Relay in the SYSTEM MONITOR Module. The Antenna Relay RX connector is the center connector.
5. The external antenna coax should be connected to the top connector on the SYSTEM MONITOR Antenna Relay. The antenna coax should be fed out of the repeater box through the appropriate port. If done properly, the repeater and link antenna coax's will exit on opposite sides of the repeater

box. The repeater box access ports are marked to facilitate proper installation. DO NOT FEED BOTH THE REPEATER AND LINK COAXS OUT OF THE SAME ACCESS PORT!

6. Choose either a UHF Yagi antenna or the omni antenna for setup. Rig and set up the antenna.

7. The Daniels UHF Link Accessory Box contains four (4) NFES# 1023 batteries in series-parallel to provide 15 volts. Use the six (6) foot two-wire jumper to attach the link batteries to the repeater batteries. Observe polarity. The link modules receive their power from the Daniels rack. The repeater box has an access port for the jumper cable.

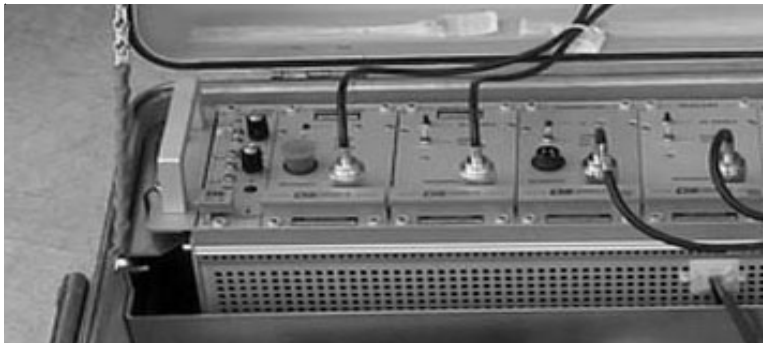
8. Ensure that the UHF TRANSMITTER AND RECEIVER Module switches are in the correct, “NORM”, position.

9. Unless special frequencies are required, the UHF TX and RX frequencies are set by selecting the proper channel number using the TX B and RX B channel Select Switch on the AUDIO CONTROL Module. The Channel Select Switch is the bottom switch on the AUDIO CONTROL Module. The switch changes BOTH the transmit and receive frequencies at the same time. SEE THE CHANNEL/FREQUENCY CHART PROVIDED. “Straight UP” is Channel 1.

10. After installation is complete, test the repeater and link modules using the appropriate portable radios before leaving the site. NOTE: BACK AWAY FROM THE REPEATER/LINK BOX A MINIMUM OF 25 FEET BEFORE TESTING.

11. If at any time there are any questions, call the NIICD CDO at telephone number: (208) 387-5644 or Pager at (877) 991-1504.

UHF LINK KIT  
DANIELS  
NFES# 4253



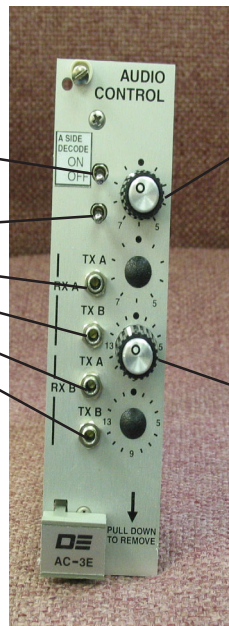
A Daniels Repeater  
with a Daniels UHF Link  
Kit installed

CTCSS Decode Off/On Switch

Not Used

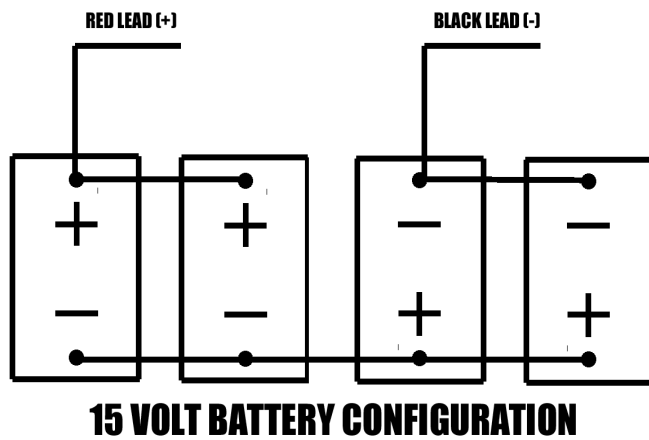
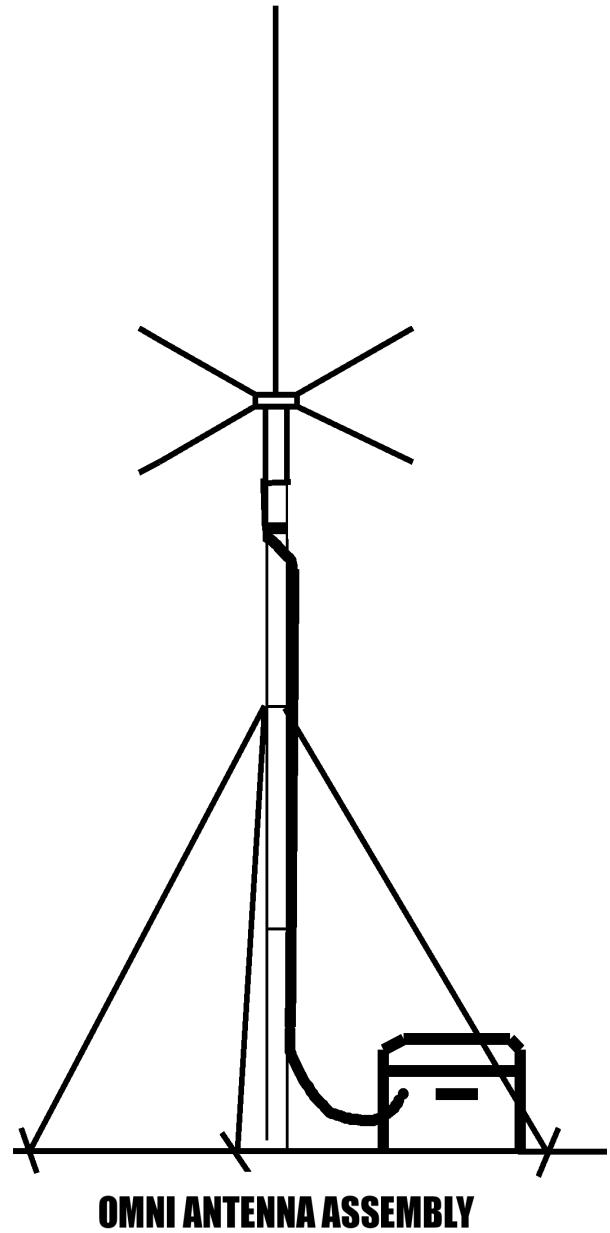
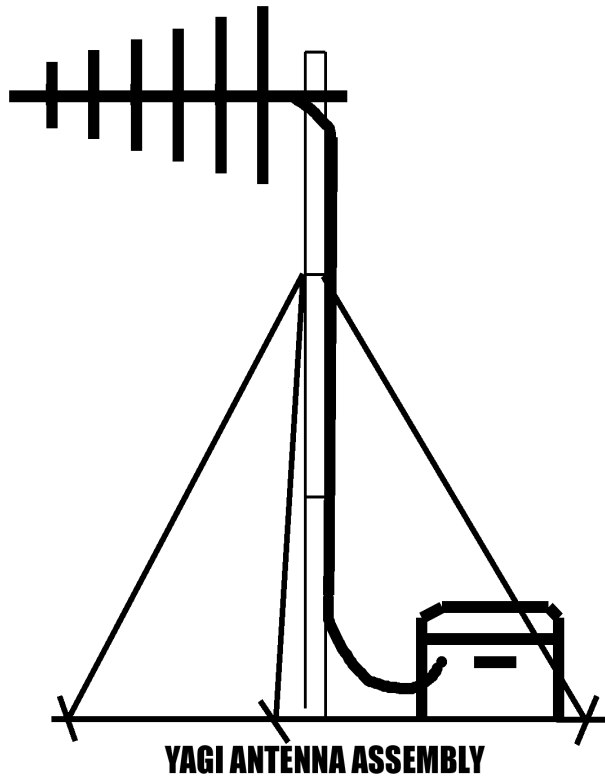
CTCSS Decode Tone Control Knob

UHF Link Freq Select Knob



A command repeater audio control card

## UHF LINK AND BATTERY CONFIGURATION



## **GROUND VHF-AM BASE STATION KIT**

### **NFES 4300**

**ANTENNA SETUP:** Connect one end of antenna cable to the base station antenna. Erect base station antenna and mast using guy ropes and stakes. Connect the other end of antenna cable to TBS-150 Ground VHF-AM Base Station.

**VOLTAGE SELECTION:** The TBS-150 can operate on 115 VAC or external 13 VDC power. **NEVER CONNECT BOTH 115 VAC and 13 VDC at the same time.**

**For 115 VAC operation:** Connect AC power cord into TBS-150 and 115 VAC outlet. Turn TBS-150 AC On/Off switch to ON. Turn 91-DE Power On/Off switch to On.

**For external power/cigarette lighter operation:** Connect 3 pin/cigarette lighter DC power cable into TBS-150 and supplied batteries or cigarette lighter. Turn 91-DE Power On/Off switch to On. Note: The TBS-150 AC On/Off switch only operates when 115 VAC is used.

**MICROPHONE CONNECTION:** Connect handmic's 3 pin connector to 91-DE MIC connector. PTT operation is from the handmic. **DO NOT transmit without the antenna connected.**

**91-DE RADIO USE:** The 91-DE radio is a 760 channel VHF-AM transceiver capable of 10 preset channels plus scanning. Frequency selection is via the keypad. Set Volume knob to mid-range. Adjust Squelch knob until squelch just quiets. See enclosed Operating Instructions book for more information.

**OTHER INFORMATION:** The TBS-150 has 4 fuses: the 91-DE's fuse is a standard 5 amp; the TBS-150's AC fuse is a 2.5 amp MDL; the TBS-150's DC fuse is a mini 5 amp; the DC power cord is an overrated 10 amp fuse and is basically unused with the TBS-150 relying on the mini 5 amp fuse for DC protection.

This kit is designed for base station use only and will not be operated in an aircraft.



Technisonic  
MODEL TL-91-DE

POWER ON VOLUME SQUELCH

5A MIC PHONE

1 2 3 4 5 6 7 8 9 0

ON 2.5A 5A

OFF AC AC FUSE EXT. DC FUSE

POWER SUPPLY/CHARGER  
MODEL SPG-007

VHF AM  
BASE STATION  
7W





## **REMOTE KIT NFES #4330**

This Kit consists of one box plus the antenna poles.

1. Remove the Remote Desk set from the box along with 2 ea. 6 volt Hotshot batteries. If AC power is not available, place the power switch on the bottom of the desk set in the 12v position, then connect the Hotshot batteries to the DC power cable. See the drawing for correct battery polarity.
2. If AC power is available, be sure that the power switch on the bottom of the Desk Set is in the AC position, then plug in the Desk Set.

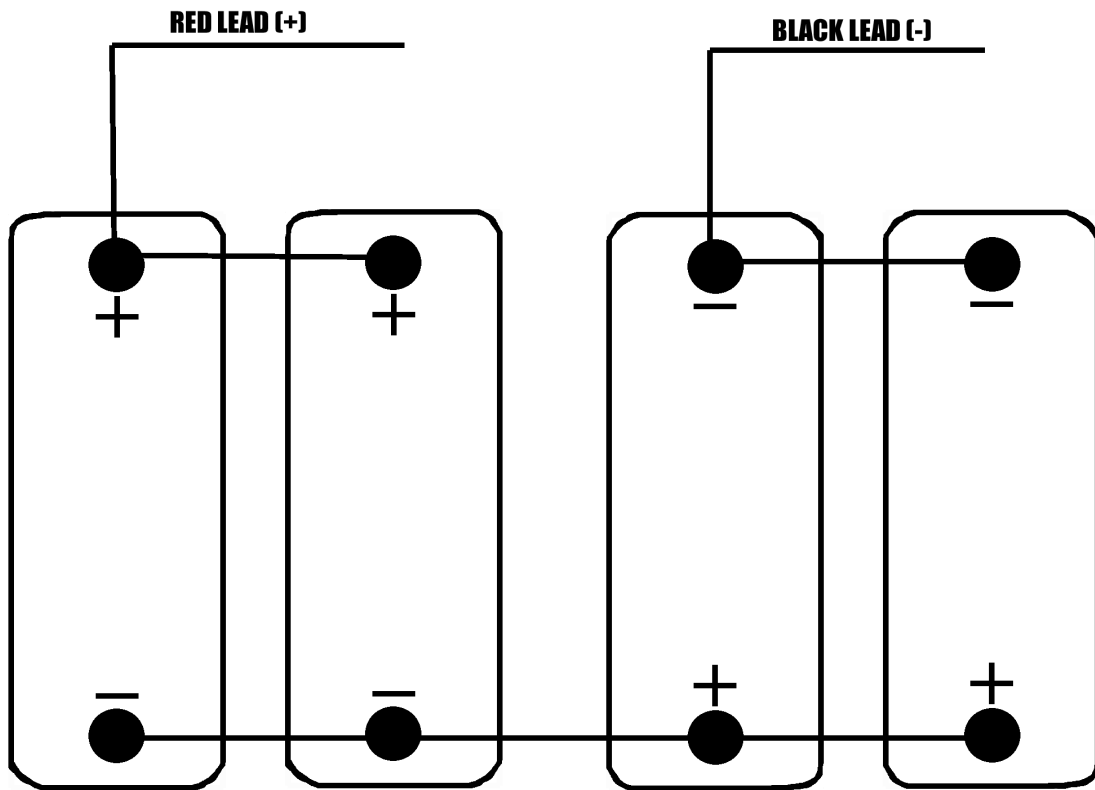
### **CHASSIS INSTALLATION**

1. Remove the gray chassis box. Select a high location common to the desired service areas and within range of available communications wire supplied in the kit (1/4 mile). Take the remaining equipment to the selected location for the remote installation.
2. Erect the appropriate antenna (UHF, VHF, UHF Yagi) and attach the coax cable from the antenna to the coax connector on the outside of the gray chassis box.
3. Connect the remote end of the communications wire pair to the remote chassis terminal lugs on the outside of the gray chassis box (no polarity).
4. **INSIDE THE CHASSIS BOX:** Adjust the radio volume to a comfortable level. ( a ballpark designation is listed in the chassis lid for each type of radio.) If the radio has an adjustable squelch control, turn it to full quieting, if the chassis is in a remote location, OR, turn it to threshold, if the chassis will be easily accessible.
  - a. Choose the appropriate radio adapter cable for the type of radio to be used (KING) and strap the radio into the velcro holder on the lid after connecting the proper antenna jack.
  - b. Attach the BNC connector from the radio cable to the chassis to provide power. Attach the audio plug to the chassis connector (be sure to line up the pin holes).
  - c. Attach two 6v batteries (in series) for the King radio (battery cable will have to be shut in the lid to close the chassis box). See diagram for battery wiring.
5. String the communications wire back to the site of the Desk Set. Attach the wire to the base-ended pair on the Desk Set using the wire nuts provided. Flag the wire where it may be a safety hazard.

## REMOTE KIT NFES #4330



## REMOTE KIT NFES #4330



**6 VOLT BATTERIES CONNECTED IN SERIES/PARALLEL  
TO INCREASE AMPERAGE FOR THE CPI DESKSET.**

# GROUND AIRCRAFT RADIO/LINK KIT

## NFES #4370

### BASE STATION ONLY INSTALLATION

1. Erect the AV-1 aircraft antenna, according to the drawing. Attach the coaxial cable through the hole provided in the left side of the fiberglass kit box to the Antenna A, AM port on the system monitor, using a 90° UHF connector (NFES# 4180) at the port.
2. Connect the battery leads as shown in the drawing. There are several power supply options available (12-15 Volts) and the corresponding cables are included in the kit. To power up the unit, connect the cable from the power source to the cable coming from the unit's subrack (there is no on/off switch).
3. Place the two toggle switches on the audio control module in the down position. Place the VHF/AM transmitter module toggle switch and the VHF/AM receiver module toggle switch in the "NORM" position and make sure that both UHF/FM modules' toggle switches are in the "OFF" position.
4. Connect the microphone to the AM transmitter module. To use the low power internal speaker, switch the system monitor audio toggle switch to the "A" position, place the system monitor rotary function switch in position #2, and turn the rotary volume knob up to the desired level.  
To use the external high power speaker, connect the speaker leads to the system monitor "METER" jacks, observing the correct polarity, switch the system monitor audio toggle switch to the "A" position, place the system monitor rotary function switch in position #1, and turn the system monitor rotary volume knob up to the desired level.
5. Set the desired AM frequency by turning rotary Switch A on the audio control module to the assigned channel. This switch controls both the transmitter and the receiver modules. Channels 1 through 6 are preprogrammed with AM simplex frequencies according to the AM frequency chart. **Channel 16** is user-programmable through the modules' front display faces.

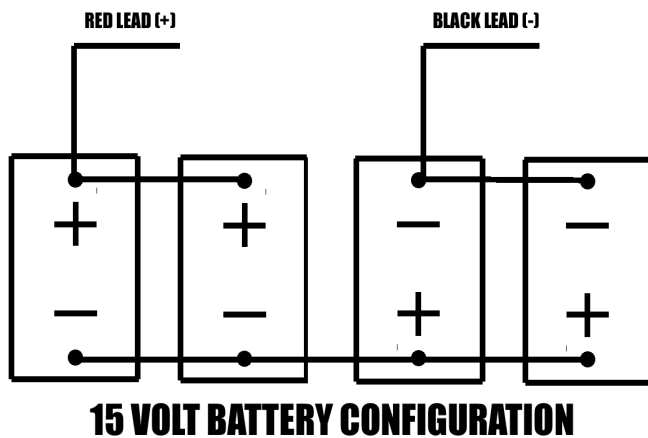
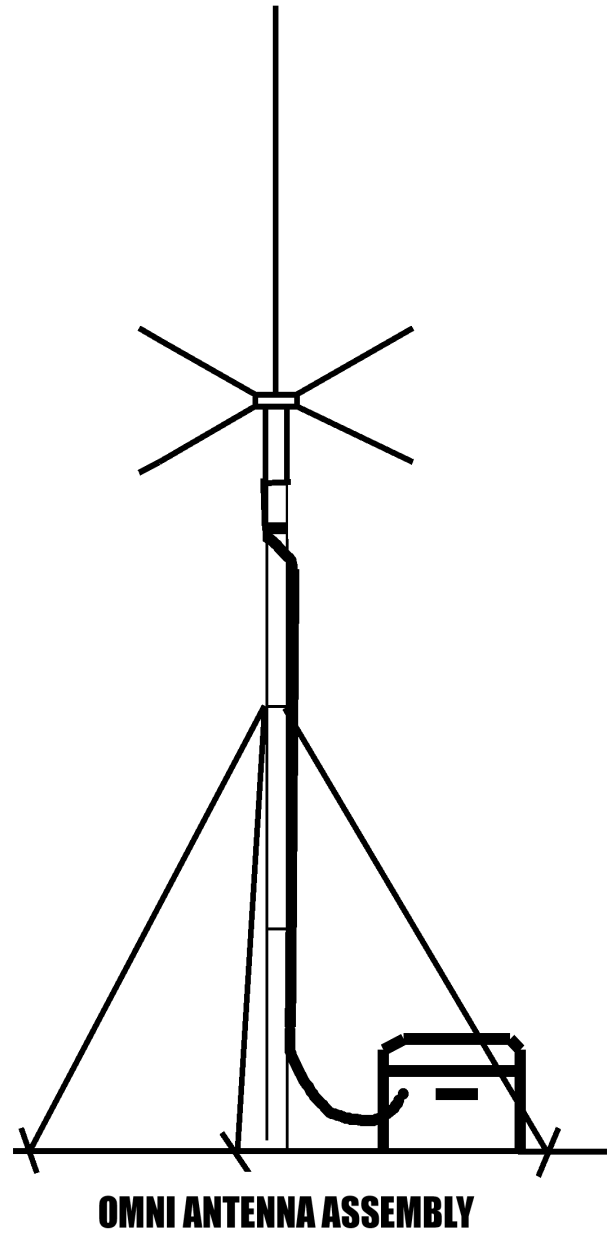
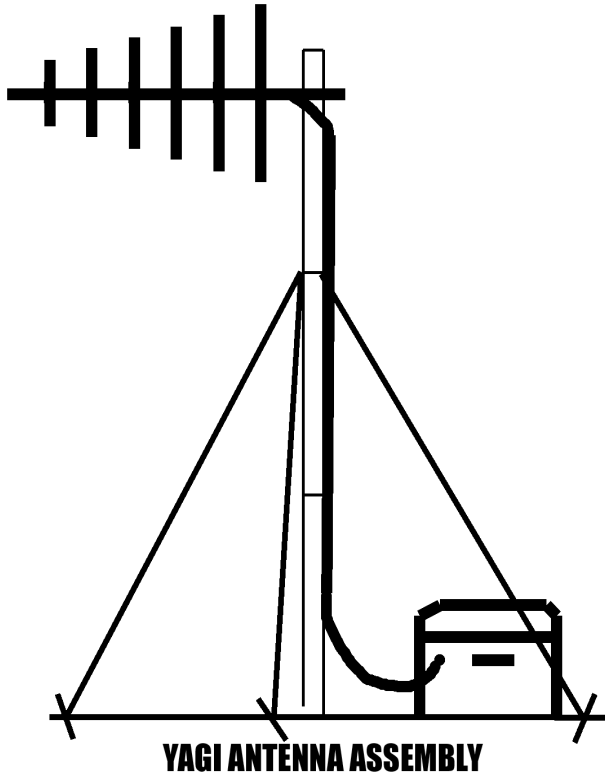
To program an authorized frequency into **channel 16** of either the receiver or transmitter module: Turn rotary Switch A on the audio control module to **channel 16**. Then unlock the unit by hitting the "\*" button and, before the "LOCKED" display goes blank, hit the "**down arrow button**" button. The display should now show "UNLOCKED". Wait for the display to blank, then hit the "**down arrow button**" button. When the display is



showing the frequency, press and hold either the “**down arrow button**” or “**up arrow button**” button until the desired frequency is reached. The transmitter and receiver modules must be individually programmed. The unit is ready for base station operation.



# GROUND A/C RADIO/LINK INSTALLATION



# GROUND AIRCRAFT RADIO/LINK KIT

## NFES #4370

### AC RADIO/LINK INSTALLATION

1. Before setting up either antenna, keep in mind that maximum antenna separation is mandatory. Be sure that the antennas' coax cables will reach the sides of the AC radio/link kit box and allow for a drip loop.
2. Erect the AV-1 aircraft antenna as shown in the drawing, keeping in mind Step #1. Attach the coaxial cable through the hole provided in the left side of the fiberglass kit box to the Antenna A, AM port on the system monitor, using a 90° UHF connector (NFES #4180) at the port.
3. Erect the UHF omni-directional antenna as shown in the drawing, keeping in mind Step #1. Attach the coaxial cable through the hole provided in the right side of the kit box to the Antenna B, FM port on the system monitor, using a 90° UHF connector (NFES #4180) at the port.
4. Connect the battery leads as shown in the drawing. There are several power supply options available (12-15 Volts) and the corresponding cables are included in the kit. To power up the unit, connect the cable from the power source to the cable coming from the unit's subrack (there is no on/off switch).
5. Place the two toggle switches on the audio control module in the down position. Place both VHF/AM modules' toggle switches and both UHF/FM modules' toggle switches in the "NORM" position. Place the system monitor audio toggle switch in the center (off) position.
6. Set the desired AM frequency by turning rotary Switch A on the audio control module to the assigned channel. This switch controls both the transmitter and the receiver modules. Channels 1 through 6 are preprogrammed with AM simplex frequencies according to the AM frequency chart. **Channel 16** is user-programmable through the modules' front display faces.

To program an authorized frequency into **channel 16** of either the receiver or transmitter module: Turn rotary Switch A on the audio control module to **channel 16**. Then unlock the unit by hitting the "\*" button and, before the "LOCKED" display goes blank, hit the



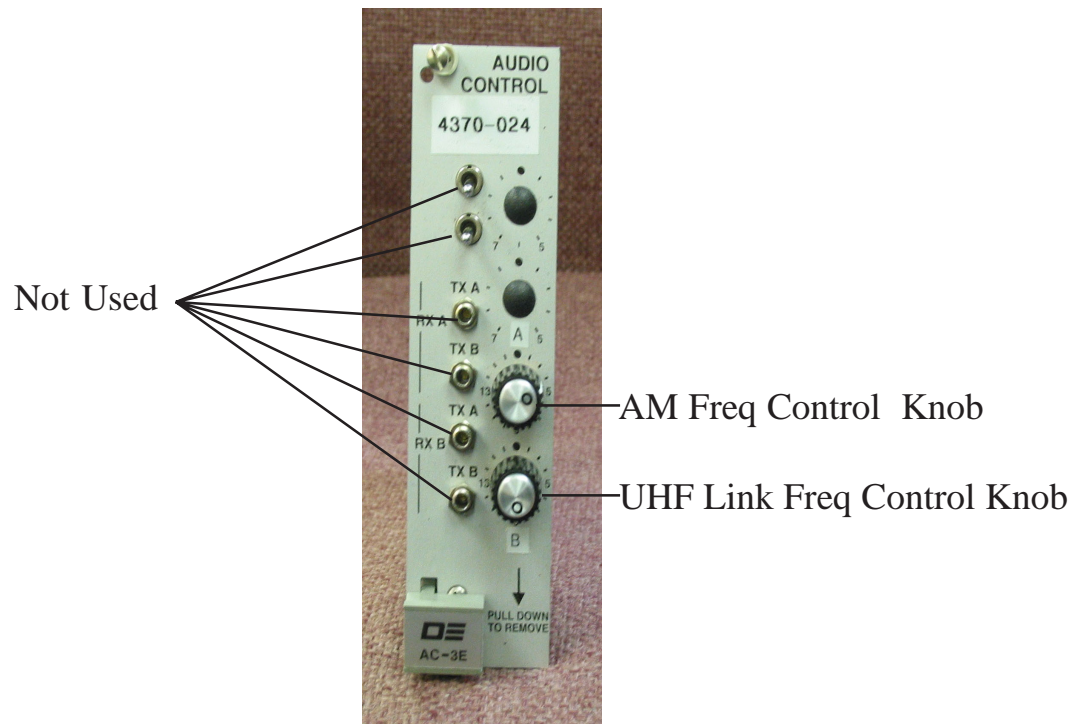
**“down arrow button”** button. The display should now show **“UNLOCKED”**. Wait for the display to blank, then hit the **“down arrow button”** button. When the display is showing the frequency, press and hold either the **“up arrow button”** or **“down arrow button”** button until the desired frequency is reached. The transmitter and receiver modules must be individually programmed.

7. Set the desired FM frequency by turning rotary Switch B on the audio control module to the assigned channel according to the UHF/FM frequency chart. This switch controls both the transmitter and the receiver modules.

The unit is now ready for link operation. Before leaving the site, perform a radio test through both antennas using both an VHF/AM and an UHF/FM handheld radio. Step at least 40-50 feet away from the unit while performing the test.

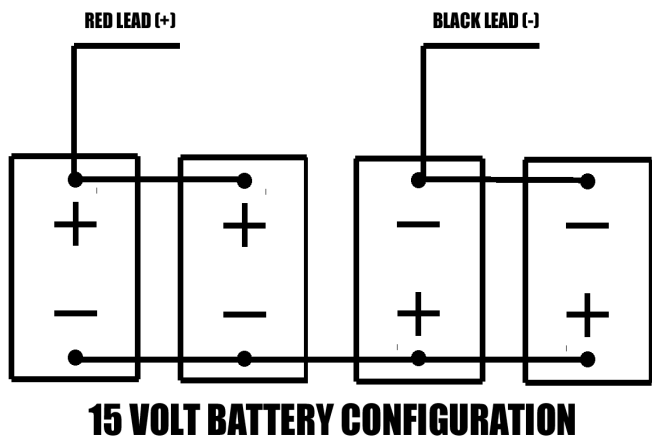
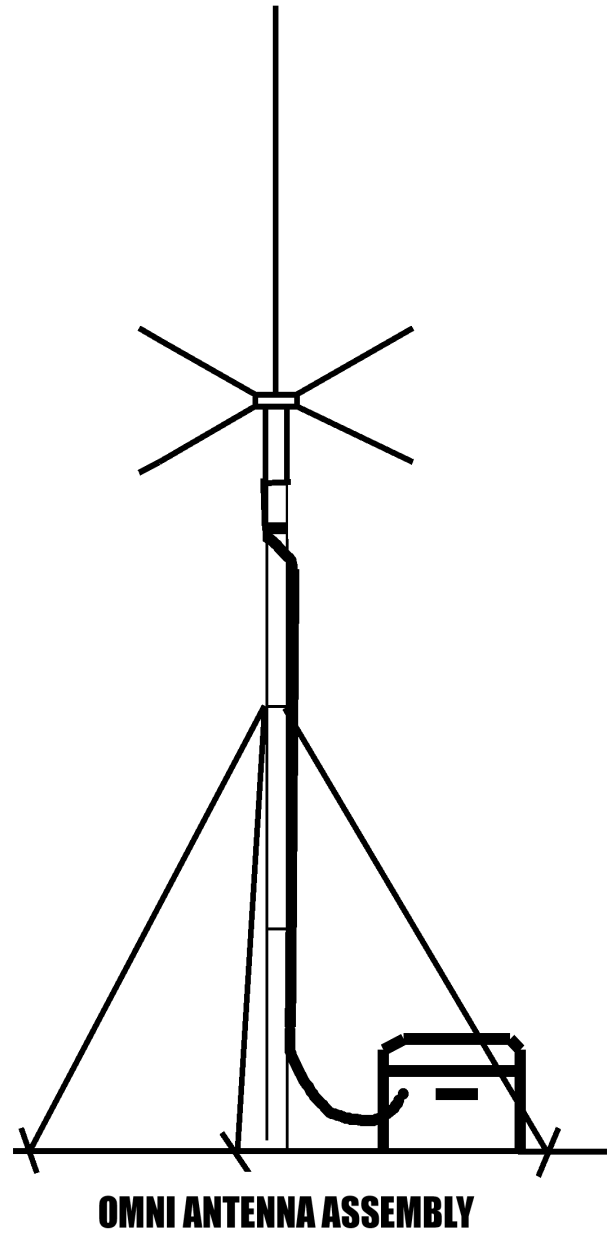
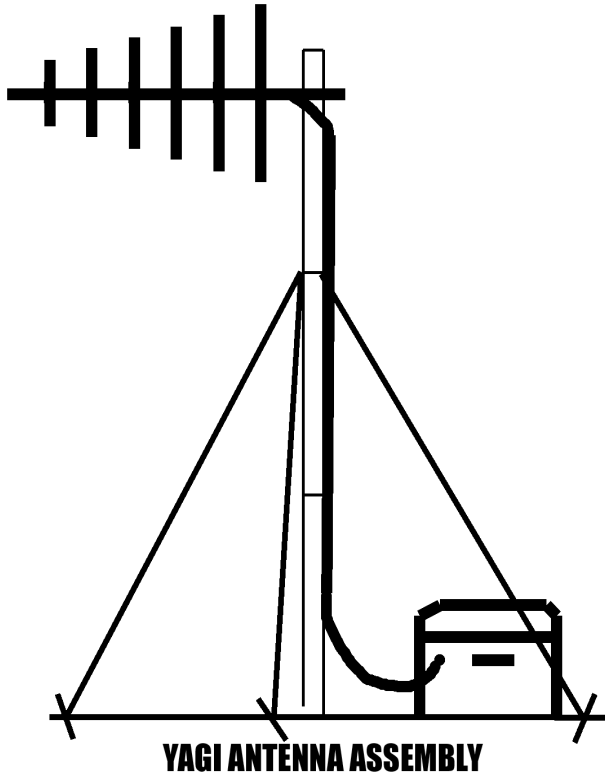






A Audio Control Card for the 4370 Aircraft Link

# GROUND A/C RADIO/LINK INSTALLATION



## **PUBLIC ADDRESS KIT**

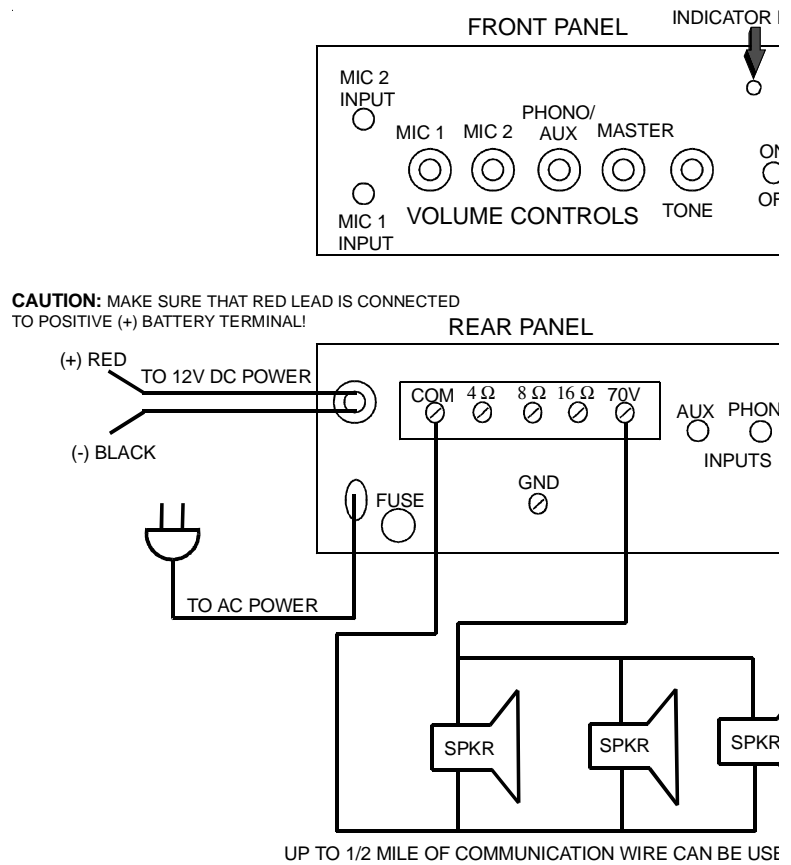
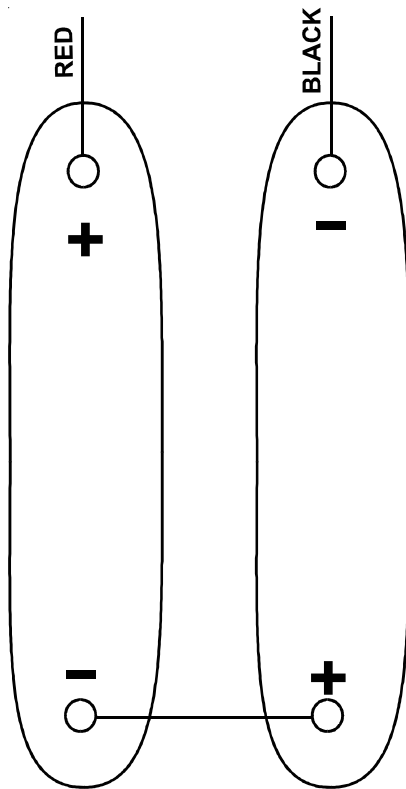
### **NFES# 4410**

The kit consists of one 20 Watt amplifier, 2 - 3 speakers designed for outdoor use, and tools and accessories necessary for installation.

1. Connect the amplifier to a power source.
  - A. For 115VAC operation use the power cord provided. An extension cord is provided for added convenience.
  - B. For 12 -15VDC operation, a similar cord is provided but with polarized clips rather than an AC plug. CAUTION: Observe polarity when operating the amplifier on 12 - 15VDC!
2. Connect the microphone to "MIC 1" or "MIC 2" on the front panel.
3. Connect the communication wire to the 70V and COM terminals on the rear panel.
4. String the communications wire to the remote speakers and connect the speakers as shown in the diagram. Use the wire nuts provided for these connections.
5. Before turning the amplifier ON, turn all volume controls to minimum. Place the ON-OFF switch to the ON position, rotate the master volume control about halfway. Adjust the correct MIC control until a satisfactory output is obtained. Any further adjustments should be made using the master control.

# PUBLIC ADDRESS KIT NFES# 4410

2 EACH 6 VOLT BATTERIES  
CONNECTED IN SERIES  
FOR 12 VOLTS



## **AIR ATTACK KIT INFORMATION**

### **NFES 4499**

The NFES 4499 Air Attack kit is a compact slip-in kit providing multiple VHF-FM radios for missions ranging from simple Reconnaissance to complex Air Attack. The kit has up to two VHF-FM radios, two AUX-FM connections and may have up to four operators. The kit operates on either 14 VDC or 28 VDC. A storage compartment in the kit holds no equipment.

**KIT SECURITY:** The NFES 4499 Air Attack kit must be secured for safe flight using the two silver “D” handles and the supplied adjustable strap’s. Secure the kit to any ridged structure in the cockpit (using common sense and keeping safety in mind).

**VOLTAGE SELECTION:** The NFES 4499 Air Attack kit has automatic voltage selection for 14 VDC or 28 VDC. Automatic selection is dependent upon correct input voltage via the power cable jumper.

**AIRCRAFT POWER & AUDIO CONNECTIONS:** Aircraft must have an MS3112E12-3S (female) power connector in the aircraft (14 volts on pin C or 28 volts on pin A, and ground on pin B). Only 14 or 28 VDC need be wired in the aircraft, **never both**. Attach power cable jumper from kit to MS3112E12-3S power connector in aircraft. Attach audio/mic cable jumper from kit to pilot’s audio and mike jacks. Aircraft mike jack must have PTT capability.

**ANTENNA CONNECTIONS:** Aircraft must have one to four broadband VHF-FM aviation antennas installed (Comant type CI-177 or equal) using RG-58 A/U or better coax cable terminated with male BNC connectors. Connect the first VHF-FM antenna connector to RADIO 1 ANT jack. Attach a second VHF-FM antenna to RADIO 2 ANT (if a second VHF-FM radio is installed in the kit). The third and fourth VHF-FM antennas are for AUX-1 and AUX-2. Use supplied female BNC barrel connectors to mate AUX-FM radio adapter to aircraft antenna cable for AUX-FM operation.

**AUDIO SELECTOR PANEL:** The TAC-250 is a dual audio selector panel for the pilot (left) and ATGS (right). Two observer positions operate off the ATGS’s audio selector panel. Attach observer headset adapter cord assemblies at the rear of the kit. Observer positions have the same radio receive, transmit, and VOX capability as selected by the ATGS’s audio selector panel.

Transmit selection. (1) COM is for the aircraft’s audio system (via pilot’s mic jack). (2) FM1 is the upper VHF-FM radio (beside the TAC-250). (3) FM2 is the lower VHF-FM radio. (4) AUX1 is for AUX-FM 1. (5) AUX2 is for AUX-FM 2. (6) SC is for simulcast using COM and FM1 (transmits on both radio simultaneously).

Receive selectors/level. (1) The companion receiver is automatically selected when a transmitter is selected on the corresponding audio selector panel. (2) COM is for the aircraft’s audio system (via pilot’s audio jack). (3) FM1 is the upper VHF-FM radio (beside the TAC-250). (4) FM2 is the lower VHF-FM radio (if installed). (5) AUX1 is for AUX-FM 1. (6) AUX-FM 2 has no receiver selector (transmitter selector must be on AUX2 to hear AUX2 audio). (7) Simulcast uses COM and FM1 receive toggle switches. (8) Receive (RX) volume level is the inner knob with VOX volume level being the outer knob.

VOX (Voice Activated Intercom). For no intercom, rotate the VOX knob fully CCW. Rotating VOX knob CW adjusts VOX activation level accordingly. VOX volume level is the outer knob with RX volume level being the inner knob.

NORMAL/EM/ISOL switch: (1) NORMAL provides normal operation of VOX and amplified radio audio to all headset positions. (2) EM is emergency. EM position is used when a power failure effects the TAC-250 or Air Attack kit. Transceiver mic will be routed to the radio selected by the transmitter switch with non-amplified audio. VOX will not operate in EM. (3) ISOL isolates the pilot's audio from the ATGS and both observers. The pilot will not be able to hear the ATGS or observers, however; the ATGS and observers will be able to hear the pilot and have normal intercom among themselves.

The pilots audio selector panel has transmit priority over the ATGS's audio selector panel if they both have selected the same radio on their respective transmitter select switches.

**TDFM-136/TFM-138B RADIO USE:** Operation and programming instructions are in the enclosed Operator's Guide. One or two VHF-FM radios may be issued depending upon quantity available.

Guard 1 and Guard 2 must never be re-programmed. The Guard receiver's are dedicated to AIR GUARD operation (168.6250).

**AUX-FM CONNECTORS:** Two AUX-FM connector's are located at the rear of the kit. This allows handheld radio's to be operated through the audio selector panels as AUX1 and AUX2. The user must supply a handheld radio and a standard AUX-FM adapter cable. Two BNC female barrel connectors are included for antenna cable mating. Any type handheld radio using any frequency band may be used (dependent upon installed aircraft antenna frequency band).

**OTHER INFORMATION:** Radio programming "D" connectors are located on the kit's front. Both pilot and ATGS MIC jack's have PTT capability using supplied PT-300 adapters. 28 VDC power input uses the 7.5 amp circuit breaker and normally draws 3 amps transmitting. 14 VDC power input uses the 15 amp circuit breaker and normally draws 8 amps transmitting.

Keep in mind there are three (3) transmitter selector switches: TAC-250 transmitter selector knob; TDFM-136/TFM-138 radio MAIN & GUARD switch; and the aircraft's audio selector panel switch.

# AIR ATTACK KIT

## NFES# 4499





**MAFFS KIT**  
**THIS KIT HAS NO NFES NUMBER IT IS ORDERED BY**  
**NAME ONLY**





**15 VOLT SERIES/PARALLEL CONFIGURATION USING  
(3) THREE SETS OF 7.5 VOLT BATTERIES (NFES# 1023)**

